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SIXTH REPORT

OF THE

DAIRY ASSOCIATION

OF THE

PROVINCE OF QUEBEC

APPENDIX TO THE REPORT OF THE HONORABLE THE COMMISSIONER OF AGRICULTURE AND PUBLIC WORKS.

1887

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VIII

THE DAIRY

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Officers and Directors of the Dairymen's Association

FOR 1888.

Honorary President: M. Siméon Lesage, Quebec.
President: The hon. P. B. de Labruère, St. Hyacinthe.
Vice-President: M. L'Abbé D. Gérin, St. Justin.

DIRECTORS

Name.	District.	Residence.
F. Prefontaine	Arthabaska	Durham-Sud.
J. Bilodeau	Beauce	St-Elzéar.
S. A. Brodeur	Beauharnois	Valleyfield.
H. Poirier	Bedford	Roxton-Falls
Cléophe Côté	Charlevoix	Les Eboulements.
S. Fortin	Chicoutimi and Saguenay	St-Prime.
O. Bergeron	Iberville	St-Athanase.
J. J. A. Marsan	Joliette	L'Assomption.
J. C. Chapais	Kamouraska	St-Denis-en-bas.
N. Bernatchez, M. P.P.	Montmagny	Montmagny.
Alexis Chicoine	Montreal	St-Marc.
L'abbé T. Montminy	Quebec	St-Agapit.
J. Ls. Lemire	Richelieu	La Baie-du-Febvre
E. Hébert	Rimouski	Saint-Fabien.
A. McCallum	St-François	Danville.
L. T. Brodeur	St-Hyacinthe	St-Hugues.
B. Beauchamp, M.P.P.	Terrebonne	Ste-Thérèse.
E. A. Barnard	Three-Rivers	Three-Rivers.

THE DAIRY

SIXTH ANNUAL REPORT OF THE DAIRYMEN'S ASSOCIATION OF THE PROVINCE OF QUEBEC.

To the hon. Commissioner of Agriculture,
And Public Works.
Quebec.

Sir,

The board of directors of the Dairymen's Association of the Province of Quebec have the honour to present to you the following report of their proceedings during the year 1887, and of the annual meeting held at St. Hyacinthe the 11th and 12th of January last.

The Secretary-Treasurer of the Dairymen's
Association of the Province of Quebec

(Signed) J. de L. Taché,

Quebec, this 1st of March, 1888.

LEGISLATION

45 VICT., 1882, CAP. LXVI.

An act to authorize the formation of a society under the name of the "Industrial Dairy Society of the Province of Quebec"

[*Assented to 1st May*, 1882.]

HER MAJESTY, by and with the advice and consent of the Legislature of Quebec, enacts as follows :

1. The lieutenant governor in council may authorize the formation for the province of an association, having for its object to encourage the improvement in the manufacture of butter and cheese and of all things connected therewith, under the name of the : "Industrial Dairy Society of the Province of Quebec."

2. The society shall be composed of at least fifty persons, who shall sign a declaration in the form of the Schedule annexed to this act ; and every member of the society shall subscribe and pay, annually, a sum of at least one dollar to the funds of the society.

3. Such declaration shall be made in duplicate, one to be written and signed on the first page or pages of a book, to be kept by the society for the purpose of entering therein the minutes of their proceedings, during the first year of the establishment of such society, and the other shall be immediately transmitted to the Commissioner of Agriculture, who shall, as soon as possible after its reception, cause to be published a notice of the formation of such society, in the *Quebec official Gazette.*

4. From and after the publication, in the *Quebec official Gazette*, of the notice of the formation of the society, it will become and shall be a body politic and corporate, for the purpose of this act, and may possess real estate to a value not exceeding twenty thousand dollars.

5. The society shall have power and authority to make by-laws, to prescribe the mode or manner of admission of new members, to regulate the election of its officers, and generally the administration of its affairs and property. The commissioner of agriculture and public works shall *ex-officio* be a member of the society.

6. The first meeting of the society shall be held in the city of St. Hyacinthe, on the 28th of November next, to proceed to its organization and the election of members of the board of directors, and discuss all matters conneted with the objects of the society.

7. The society shall afterwards hold an annual meeting, at such time and place as shall have been selected by the board of management, besides those which may have been prescribed and determined by the by-laws ; it at such annual meeting, shall elect a president, and vice-president, a secretary-treasurer, and also one director for each judicial district of the province, chosen from among the members of the society domiciled in such districts.

8. The officers and directors of the society shall prepare and present, at the annual meting of the society, a detailed report of their operations during the past year, indicating the names of all the members of the society, the amount subscribed and paid by each, the names of the factories, inventions, improvements and products which deserve public notice, and giving all the information which they deem useful in the interests of the dairy industry.

SCHEDULE.

We, the undersigned, agree to form ourselves into a society, under the provisions of the act 45 Victoria, chapter 66, under the name of the "Industrial Dairy Society of the Province of Quebec;" and we, hereby, severally agree to pay to the treasurer, yearly, while we continue members of the society, the sums opposite to our respective names, and we further agree to conform to the rules and by-laws of the said society.

NAMES.	$	cts

EXTRACT

From 45 Vict, 1882, chap. 22, intituled: "An Act to impose certain direct taxes on certain Commercial Corporations" as amended by 46 Vict., 1883, chap. 7.

HER MAJESTY, by and with the advice and consent of the Legislature of Quebec, enacts as follows:

1. In order to provide for the exigencies of the public service of this Province.....every Incorporated Company carrying on any undertaking, trade or business in this Province.....shall annually pay the several taxes mentioned and specified in section 3 of this Act, which taxes are hereby imposed upon each of such commercial corporations respectively.

2.....The term "Incorporated Company" does not include companies publishing newspapers or periodicals, nor societies or establishments, in this Province, for the manufacture of butter or cheese, or of both combined, established under the Act 45 Vict, chap. 65, nor the Dairy Association of the Province of Quebec, established by the Act 45 Vict., chap, 66, nor the Mutual Insurance Companies recognized by or established under the Act 42-43 Vict., chap. 39, and its amendments, nor the compa-

nies established for the construction and maintenance of toll-bridges, nor associations or companies established for drainage, agricultural or colonization purpose,

This Act shall come into force on the day of its sanction.

CONSTITUTION OF THE DAIRYMEN'S ASSOCIATION

Incorporated by the statute 45 *Vic. Chap.* 66 *P. Q.*

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1. The Association takes as its designation : "The Dairymen's Association of the Province of Quebec."

2. The object of the association is to encourage the improvement of the manufacture of butter and cheese, and all things connected with the above manufacture.

3. To become a member of the association, a subscription of at least one dollar ($1.00) a year is all that is requisite.

4. The affairs of the association shall be under the direction of a president, a vice-president, a secretary-treasurer, and certain directors named in accordance with the act of incorporation, all of whom shall form the Board of Directors of the association, and shall make a report of the operations of the association at the annual general meeting of the association.

5. The election of the officers and directors shall take place at the annual general meeting, the date of which shall be fixed by the board : to insure the right of voting at the above election, the previous payment of subscriptions will be requisite.

6. When more than one candidate is proposed for the same office, the voting shall be by *sitting* and *standing* (*assis et levés*), the secretary shall count the votes, and the president shall declare the candidate who shall have the majority of votes.

7. The officers elected shall remain in office until the following election, and shall be re-eligible.

8. The president shall take the chair at the general meetings, and at the meetings of the board of directors.

9. The president shall be, *ex-officio*, a member of all the committees of the board of directors.

10. To the secretary-treasurer shall be entrusted all the money and other valuables belonging to the association ; he shall keep in a special register, minutes of all meetings of the association as well as of the board

of directors, and these minutes shall be signed by the president, or, in his absence, by the vice-president, and by the secretary treasurer; he shall, besides, keep books in which shall be entered, regularly and without delay, all the monetary operations of the association. At the end of the fiscal year of the association, the secretary shall present before the board a statement of accounts for the directors' approbation.

11. The vacancies which occur among the officers or directors shall be temporarily filled up by the board, and the board shall also nominate the directors for those judicial districts which are not as yet represented.

12. The board, to insure greater efficacy, shall be at liberty to claim the services of specialists as advisers.

Rules and Regulations of the Dairymen's Association

1. The annual or general meetings of the association, as well as those of the board of directors, shall be called by notice in writing from the secretary treasurer to each of the members of the Association and of the board. Notice of the meetings of the association shall be given at least a month beforehand.

2. At the request of three directors or officers of the association, the the president may call a general meeting of the board of direction; the call shall be in the form mentioned above.

3. At the meeting of the board of directors, three shall form a quorum, exclusive of the president and vice-president.

4. The board of directors may name, from among its members, a committee to audit the accounts, and other committes for any purpose it may think necessary.

5. The order of business at general and official meetings shall be determined by the board of directors.

6. No question shall be submitted for discussion except it be in writing and placed before the secretary treasurer.

7. The secretary treasurer shall be obliged to furnish security to the amount of $400.00 which security shall be subject to the approval of the board.

MEETING OF THE 11th AND 12th JANUARY, 1888.

Sixth Annual meeting, held at St. Hyacinthe

Minutes of the meeting.

St. Hyacinthe, January 11th, 1888.

The members of the Dairymen's Association met at the Court House, at St. Hyacinthe, at ten o'clock, a. m.

The Hon. P. B. de la Bruère, president, took the chair.

The secretary received subscriptions of the members present.

Mr. J. J. A. Marsan, seconded by Mr. Bernatchez, proposed : That the Rev. Mr. Gérin and Mr. J. C. Chapais be named as auditors to examine the accounts of the secretary-treasurer. (Carried).

Mr. J. C. Chapais, seconded by l'abbé Montminy, moved : That a committee be appointed to examine the sample of full-milk and partially-skimmed-milk cheese, submitted to the meeting, in conformity with a resolution passed at the meeting at Three-Rivers. (Carried)

Proposed by Mr. A. Chicoine, seconded by Mr. S. Fortin : That Messrs. C. Langlois, J. A. Vaillancourt, and E. De Longchamps, be named as a committee to examine the samples of butter made by Mr. Chicoine, with a view to the clearing up of certain points in the manufacture of butter which are still obscure.

Mr. Bernatchez, seconded by l'abbé Gérin, proposed : That Messrs. S. Côté, W. Wilson and J. A. Vaillancourt, form a committee to examine the cheese. (Carried). Mr. Wilson refused to be a member of the committee.

Mr. W. H. Lynch, seconded by M. J. C. Chapais, proposed : That the association authorise Mr. Lynch to offer a grant of $50 to the meeting of English speaking farmers, shortly to take place at Knowlton, to aid in the formation of a local Dairymen's Association for the English division of the Province of Quebec.

Messrs. Lynch and Chapais supported the motion in a few sentences and it was carried.

The president read letters from MM. Joly, Beaubien, and Lemire, saying how sorry they were at not being able to be present at the meeting. The president then read out the programme for the after-noon meeting, and the meeting was ajourned to 1.30 p. m.

JANUARY, 11th. 1.30 P. M.

The president opened the session at half-past one p. m.

Mr. W. Wilson having refused to be on the committee for examining the samples of cheese, l'abbé Montminy, seconded by l'abbé Chartier, proposed : That Mr. S. Fortin be appointed in the place of Mr. Wilson. (Carried).

The Hon. Mr. de la Bruère, president, then pronounced his " official opening speech " to the meeting. He explained the position of the association showing how serviceable it had been to the dairy-business, and expatiated on the state and condition of that business in the province of Quebec.

Mr. Chapais read the report of the auditors, showing that the accounts of the secretary-treasurer had been found to be perfectly correct.

L'abbé Provencher gave a lecture on "*the fungi and the insects that affect the products of the dairy.*"

The report of the committee for the examination of the *butter-samples* was read by the secretary, as well as the explanations written by Mr. Chicoine, the sender of the samples.

Messrs. Taché, Chicoine, Coté, Chapais, Langlois, Vaillancourt, and the Rev. père Antoine, Trappist, of Oka, gave in turn certain explanations connected with " *the manufac ture of butter.*"

Mr J. C. Chapais gave a lecture on " *the qualifications and relations of the proprietors, the makers, the managers, and the patrons of butter and cheese factories.*"

L'abbé Chartier gave a few statements on " *the cultivation and ensilement of Indian corn, compared with the cultivation of mangels* ". A discussion on the same subject followed, in which Messrs. Casavant, Denis, Dion, Brodeur, Couture, Marsan, and the abbé Provencher, took part.

Mr. Vaillancourt presented the report of the committee on " *whole-milk and partially-skimmed-milk cheese* " and submitted it to the meeting.

In a discussion of the subject of partially-skimmed milk cheese, Messrs. Gérin, Chapais, Vaillancourt, Bernatchez, Archambault, Gendron, Ayotte Chartier, and Taché took part.

After this discussion, the *president* adjourned the meeting to 8 P. M.

January 11th 8 P. M.

The president took the chair at eight o'clock. The sitting was opened by a lecture from the Rev. père Jean-Baptiste, of the Trappist-monastery at Oka, on the " *Working of the creamery at the Oka Monastery.*"

Messrs Chapdelaine, Fortin, Wilson, Coté, and Couture, asked several questions of the Rev. Jean-Baptiste about the creamery.

The president requested Mr Bernatchez, M. P. P., president of the agricultural commission, to relate to the meeting the "*Impressions* made *upon his mind during the inspection, and by the visits made by the agricultural commission.*" To this request, Mr. Bernatchez acceded, and gave an address on the subject.

Dr Couture gave a lecture on "*The Physiology of the digestion of animals.*"

After a speech from Mr. Lesage, showing that the "*Dairy industry is the hope of our agriculture,*" the president adjourned the meeting to the next day, January 12th, at ten o'clock A. M.

January 17th, 10 A. M.

At 10 A. M., The President opened the session, and invited the meeting to proceed to the election of officers and directors for the present year.

The results of the election are as follows :

OFFICERS

Honorary President : Mr. S. Lesage.
Acting President : L'hon. P. B de la Bruere, P. C. L.
Vice-President : L'abbe Gerin.
Secretary-Treasurer : Mr. J. de L. Tache.

DIRECTORS

DISTRICTS.	DIRECTORS.	RESIDENCE
Arthabaska	F. Préfontaine	South Durham.
Beauce	J. Bilodeau	St-Elzéar.
Beauharnois	S. A. Brodeur	Valleyfield.
Bedford	H. Poirier	Roxton Falls.
Charlevoix	C. Coté	Eboulements.
Chicoutimi and Saguenay	S Fortin	St-Prime.
Iberville	O. Bergeron	St-Athanase.
Joliette	J. J. A. Marsan	L'Assomption.
Kamouraska	J. C. Chapais	St-Denis.
Montmagny	N. Bernatchez	Montmagny.
Montreal	Alexis Chicoine	St-Marc.
Quebec	L'abbé T. Montminy	St-Agapit.
Richelieu	J. Ls Lemire	La Baie du Febv.
Rimouski	E. Hébert	St-Fabien.
St-François	A. McCallum	Danville.
St-Hyacinthe	L. T. Brodeur	St-Hugues.
Terrebonne	B. Beauchamp	St-Hermas.
Three Rivers	Ed. A. Bernard	Three-Rivers.

In requesting the meeting to appoint a director for the district of Beauce, the president paid a just tribute to the memory of the late Mr. H. J. J. Duchesnay, the former director for that district, one of the original and most zealous members of the association.

The secretary communicated to the meeting the result of the "*Competition of Canadian milk-cows*" held by the association, for the year 1887.

Mr. J. J. A. Marsan, seconded by l'abbé Montminy, proposed: That negociations be opened with the government in order to obtain a grant of $500, for the purpose of starting a competition open to herds of at least five cows, the milk of which is furnished in the ordinary condition to cheese factories or creameries in this province, by members of the Dairymen's Association; the board of directors of the association to regulate the condition of the competition, with power to make one or more classes of competitors.

A discussion on this subject followed in which Messrs. Chartier, Brodeur Bernatchez, Lesage, Dion, and Chapais, took part. The proposal was agreed to, on condition that the competition of Canadian cows was not to be given up.

Mr. Gérin seconded by Mr. Montminy, proposed: That the association requests the government to furnish it with means to establish a regular system of reports of the state of the market-prices of butter and cheese, for distribution over the whole of the province.

The above motion raised a discussion, in which part was taken by Messrs. Marsan, Bernatchez, Taché Lesage, Fortin, and Casavant. To the board of directors was entrusted the duty of applying a remedy to the fault pointed out in the proposal.

Mr. Casavant related to the meeting "*His experiments and success in the cultivation of lucerne for milk-cows.*"

Mr. Jos Painchaud read his report as government official inspector.

After a speech by Mr. Beauchamp, M. P. P., and some remarks by Messrs. Bernatchez, Casavant, and Provencher, on the official organization of agriculture, the question on which Mr. Beauchamp spoke, the session was adjourned to 2 P. M.

January 12th. 2 P. M.

At 2 oclock, P. M., the president took the chair.

Mr. Côté, government official inspector, read the report of his inspection.

The secretary read the report of Mr. Archambault, the Association's inspector.

Mr. P. Garrigue gave a lecture on " The organization of cheese factories and creameries."

Mr. Maurice Frey read some " Notes on cheese-making."

Mr. McDonald, cheese-maker at the school-factory at St. Hyacinthe and a *remplaçant* of Mr. Archambault for some inspections remarked upon certain defects which had been corrected during his visits.

Some observations on the making of Cheddar cheese were exchanged between Messrs. Bernatchez, McDonald, Côté, Wilson, Painchaud, Archambault and Taché.

Mr. Lesage announced to the meeting that, during the winter, there would be a " Meeting of the Horticultural Society of Montreal, and of the Fruit Growers Association of the Province of Quebec, " held at the capital of the province. All those interested in the cultivation of fruit trees Mr Lesage invited to be present.

Mr. Marsan, seconded by Mr. J. C. Chapais, requested that the next meeting of the association might be held at L'Assomption. This was left to the discretion of the board of directors.

Some remark of M. l'abbé Chartier on the cultivation of vegetable and of root-crops followed ; Mr. Côté spoke of an error in the chart (tableau) on cheese-making ; and Mr. Wilson complained of the bad quality of the boxes for cheese.

Mr. Chapais raised a discussion on the proper time to be occupied in the churning of cream.

Mr. Marsan spoke on the question of " manures in general."

Mr. Chartier, Casavant, Couture, and de Portneuf, related their experience as to the preservation of dung.

Mr. Taché pointed out the importance of the dairy industry as exemplified in the statistics furnished by *The Mail.*

Thanks were voted to the Sheriff of St-Hyacinthe, and to the care taker of the Court-House, for the comfort enjoyed by the members of the association during the meeting.

The president then thanked the association for having done him the honour of electing him, and declared the convention closed.

THE OPENING SPEECH OF THE PRESIDENT.

Gentlemen,

To-day opens the seventh annual meeting of the Dairymen's Association of the Province of Quebec.

Last year, our meeting was held at Three-Rivers, where we were welcomed by the whole population with the greatest kindness and good will. His Lordship, Monseigneur Laflèche, the Hon. Mr. Justice Bourgeois, the Hon Mr. Malhiot, mayor of the city, the inhabitants, including even the ladies, condescended to honour with their presence the opening session of the meeting.

As your president, I am happy, gentlemen, to bid you welcome to this our progressive city of St. Hyacinthe.

Those among you who have not visited this town for some years will not have failed to remark the alterations which have taken place as regards the increased population, the beauty of the new buildings, and the importance of the manufactories which have been erected.

Besides being a manufacturing town, St. Hyacinthe is the centre of a large agricultural district, and meetings such as the important one we are holding to-day cannot fail to exercise a most salutary influence on the farmers of its neighbourhood.

I observe with pleasure the presence of strangers of distinction, of farmers, and of friends of the agricultural classes. The pleasure I feel at such a sight is enhanced by the assurance it gives me that their presence is a happy presage of the prosperous future of our agriculture.

That agriculture is making progress is true enough, but it needs encouragement ; it is especially necessary that science should precede practice, and that the farmer should not be guided by routine, but by intelligence enlightened by study and reflexion.

This is one of the objects that the founders of this association proposed to themselves ; and, when the annual reports since 1882 are examined, when the lectures which have been delivered at our meetings have been read, and when we reflect on the subjects therein treated, we cannot but conclude that our association, entirely devoted to its duty, has, by its general character, conferred great benefits on the province, by contributing, to a great extent, to the powerful and lively impulse which has done so much to cause the agricultural movement which we see around us.

Let us look at the statistics.

A statement, published by the Quebec government in 1881, shows that there then existed in the province, 108 cheese factories, 30 creameries, and 5 combined cheese and butter factories. Of the cheese-factories, the counties of Rouville, Huntingdon, St. Hyacinthe, Yamaska, Bagot, and Nicolet, possessed the greater share.

In the province, there are, at present, about 60 creameries and 425 cheese-factories. I take pleasure in believing that our association has not been without its influence on this increase, which increase, alone, proves that the dairy-industry is one of the most remunerative branches of agriculture, and shows, besides, that our cheese is duly appreciated on the English market. The inspection of factories by our officers, has made, I may say, an almost entire revolution in the manner of making cheese. Considerable defects in the manufacture have been corrected by the instruction given by our inspectors, and although we have not arrived at such a pitch of perfection as is desirable, we may nevertheless congratulate ourselves on having, during the last five years, imbued several persons, who thought themselves good cheese-makers, with ideas that previously they had no notion of. Let us quote the fact, as a proof of this, that out of 200 factories, 143 have adopted the new system of manufacture taught by our inspectors.

The number of factories inspected amounts, for the season 1887, to 241.

At the school-factory of Mr. Misaël Archambault, at St. Hyacinthe, fifty-six persons came, last year, either to learn the way to make cheese, or to perfect themselves in that art. During the four years that the school has existed, 173 persons have studied there the proper method of making cheese, and Mr. Archambault deserves great praise for the zeal which he has shown in the discharge of his duties. I trust that the government will furnish us with the means of keeping up the school.

Since I am speaking of our system of cheese-making, I will read to you a letter which I saw some time ago in the Ottawa *Citizen*.

The writer drew the attention of Canadian cheese-makers to a law passed at the last session of the Imperial Parliament, intituled : *The Merchandise Marks Act*.

This act contains provisions of such severity, that it merits very careful examination by Canadians who are engaged in commerce with the United Kingdom. The correspondent cites, as an example, the provision that a Canadian who exposes for sale " Canadian Cheddar " as Cheddar cheese, without the addition of " Canadian," would be liable to a heavy

fine. Now seeing that Canadian cheese is favourably viewed in England, our exporters would do well to stamp their cheese in conformity with the provisions of the English law.

Saying that the cheese of Canada is popular on the other side of the Atlantic, reminds me of the dispatch which appeared in the papers at the end of December, stating that our cheese is so well liked by the epicures of England, that, at Christmas, several Englishmen, who could not get any caught the whooping-cough in consequence of the deprivation.

The last official reports state that, during the year ending June 30th. 1886, the exportation of Canadian cheese amounted to 78,112,927 pounds, representing a value of $6,754,627.

When we call to mind that, the first year of Confederation, the exportation of cheese only amounted to six million pounds, the country may well congratulate itself at having, in eighteen years, increased it by 72 millions.

Of cheese, during the season of 1887, there was exported, from the port of Montreal to the value of $6,371,604, against $4,346,759, the year before; or, if you like, last summer, 1,104,065 boxes were exported against 891,965 boxes in 1886.

As to butter, we see with sorrow that, since 1881, our exportation of that article has diminished by one-half. The art of butter-making has not made the same progress that the manufacture of cheese has made, and you would do well, gentlemen, to study carefully the reasons.

There is no doubt that private butter-making is not what it ought to be, and we must not conceal from ourselves that many people are ignorant of the proper means to be adopted to make an article of the best quality, and fit for exportation. The best methods of butter making must be spread abroad among the people to a greater extent than has yet been done.

On this subject, I will make the suggestion that, if the industrious wives of our farmers were specially invited to attend our meetings, they would, in the first place, reap great advantages to themselves, and clear-sighted as they are, they would acquire information which would enable them to exercise a beneficent influence over their husbands, and lead to great improvement in the general management of their farms.

Before closing these remarks, I cannot refrain, in connection with the present subject, from alluding to the provincial exhibition held last Autumn, at Quebec.

Our association, from its inception, has deeply interested itself in the

improvement of cattle and especially of the Canadian cow, whose milk-producing qualities are highly appreciated. One of our most distinguished members, Mr. E. A. Bernard, exhibited a herd of Jersey-Canadians which attracted the attention of the visitors, and was the subject of a very flattering report from practical farmers. This report bears the signature of the learned Professor Brown, of the Ontario Agricultural College, of Dr. Couture, and of Mr. Israel Tarte, and while testifying to the merits and efforts of Mr. Barnard, it asserts that the province of Quebec is essentially suited to the production of butter and cheese.

There is no doubt but that the careful, active, and reflective farmer will find a source of great profit in the dairy-business, but always on the condition that he seek for the teaching he so truly needs in the quarter whence he can most easily obtain it : he must bid farewell to routine, and study the art of cultivating the soil in earnest. What the farmers' sons really want is a thorough system of agricultural instruction, without which it is in vain for them to hope to maintain themselves at the same level of progress with other people.

In the state of Wisconsin, there are, as I saw the other day, 82 Farmers' Clubs ! Why has not each of our parishes its farmers club ?

Why, too, does not every farmer belong to the Dairymen's association, in order that the reports which it publishes every year, and which contain most practical articles on the different branches of agriculture, might be read by all.

The reply lies in the good will of all.

Thanking you for your kind attention, I here close my remarks.

THE FUNGI AND INSECTS THAT AFFECT DAIRY-PRODUCTS

Lecture by M. l'abbé Provencher.

Mr. President and Gentlemen,

I am sorry that I have been chosen to begin this series of lectures ; I fear greatly that the audience will soon be tired of hearing about insects so little known that their very existence is unsuspected, so difficult to be seen that convex glasses must be used to detect them, and with names so strange, and sometimes so whimsical, that one almost despairs of remembering them. But, as, at a dinner party, the taste of a badly concocted soup is often dispelled by the flavour of the *entrées*, so in this case I fully believe that those speakers who succeed me will blot out the memory of my *début*.

Our age, as you all know, is the age of *microbes*.

Five years ago, the name of this enemy of ours was unknown ; and to-day it is said to be the cause of almost all the evils under which we suffer. Small-pox, diphtheria, whooping-cough, fevers of all sorts, inflammation, fermentation, putrefaction, and almost all the kinds of corruption which destroy our provisions, are the work of microbes. It is worth our while, then, to understand them, at least to be well informed as to their development, their propagation, their reproduction ; for, as you well know, the first step to be taken in any war, is to thoroughly understand the enemy with whom one has to contend.

As our association devotes its attention more especially to the products of the dairy, I will talk to you of those particular microbes that infest those products. Up to the present time, I am told, the injury caused to the productions in question has not been very great, since, generally speaking, the disposal of them has been so rapid, that one has not to reckon with a long detention in storage. To this add, that the temperature of our winter enables us to escape for nearly seven months from the attacks of a great number of these enemies. Still, it may happen that these causes all of a sudden change about, and when we have to face an enemy, it is always wise to take as many precautions as possible against his attacks, however little to be feared we may suppose them to be.

And, to begin with, when we speak of microbes we do not necessarily mean to speak of insects. The word microbe comes from two Greek words, *micros*, which means little, and *bios*, life. They are living beings, in size infinitesimally small. But, as there are two lives, the vegetable life and the animal life, to which of these two does the microbe belong ? To both, I might reply, and very probably more to the first than to the second.

The microscope has revealed to us mysteries of whose existence, before its invention, we had no conception ; and it has not yet said its last word on the crowd of problems which awaits solution.

Thus, convex glasses have enabled us to show that the cell is the essential element of all life, animal as well as vegetable. The tissues of our body, as well as the tissues of plants, are made up of nothing but cells : their growth, their development are solely caused by the production, the addition, and the multiplication of already existing cells.

What, now is a cell ? It is a tiny, or infinitesimally small sac, of the simplest form, without articulations, appendices, or partitions, filled with a liquid to its utmost capacity. It is these tiny sacs that, united in one

mass by thousands and by millions, form the flesh of our members the hair, the horns, the bones of animals the trunk,the bark, the roots of the hardest trees, as well as the spongy substance of the fungi, and the animalcules invisible to the naked eye, but which the microscope shows us in almost every liquid, whether it be lying on the ground or enclosed in living bodies.

But, you will ask: if these little sacs are closed on all sides, how can the liquid they contain pass from one to the other, and thus sustain the vital motion? By virtue of a well-known physical law, *endosmosis*, which means that as often as two liquids are separated by a permeable partition they have a tendency to place themselves on the same level, by exchanging their particles, according to the relation of their densities. The food taken into the stomach clearly furnishes the blood, the chyle, and the other liquids necessary to the support of our bodies, without their having any other conduits for their passage than capillary attraction or endosmosis to transport them to vessels which belong to them as of right; and so it is in the case of the communication of one cell with another.

If we submit to the microscope cells mixed with a suitable fluid, we see them, under a proper temperature, rapidly undergo certain movements; they swell, elongate themselves,displaying often the partition that divides them; they produce buds, by means of which they multiply: the partitions separate to form complete cells, which, in their turn, form partitions for themselves; the buds break off to produce fresh buds in their turn, and so on continually, the bulk always increasing.

On the object-plate of the microscope we see cells produced, sometimes globular, oval or elliptic, sometimes prolonged into filaments, sometimes armed with little hairs like the infusorial animalcules: where shall we establish the line of division between animals and vegetable? The truth is, that the problem is as yet unsolved in a multitude of cases.

But we must not suppose that all the microbes are necessarily injurious. The Divine wisdom, which gave the world to the use of man, permits him, in numerous cases, to utilize the work of his enemies to his own advantage and profit. Thus, the microbe which causes the decomposition of butter and cheese, will serve to cause the acetic fermentation of vinegar, the alcoholic fermentation of wine or beer, and still more advantageously the butyric, etc., fermentation of milk, &c.

These premises being established, let us proceed to consider more particularly those enemies which attack our dairy-products, and which, if left to themselves, would in a short time have power to destroy those pro-

ducts. These enemies are of two classes, animal and vegetable, the former being generally the more to be dreaded.

Of all the hurtful vegetable-microbes the mildew is the worst, not only as regards its attacks upon our cheese but because, it infects all our food, our bread, our meat, our fruit, etc.

The mildew-fungus which attacks butter and cheese is known as the *Penicillium crustaceum*. Let us study its origin and the manner of its evolution.

The English call this fungus the *mould*, the French call it simply *moisissure*. But the scientific name is also important for us to know, for it is by that name that you will find it described when you seek for information on the subject in the books of those writers who have devoted themselves to the study of these creatures.

The mould is always found on the surface, showing itself in small bluish green spots on such animal or vegetable matters as offer the conditions proper for its development, viz., heat and moisture. These spots, examined under a microscope, or even a strong magnifying glass, display an assemblage of white filaments extremely loose, bearing at the ends *spores*, or little heads, resembling grains of a bluish-green dust. If these spores are spread on any substance of the same chemical composition as that whence they sprang, they will go on reproducing themselves generation after generation. But, drop them on distilled water and they swell immediately, burst, and let fall a vast number of little bodies, called *zoospores*. These set to work at once ; they elongate themselves, and separate themselves, by partitions, these divisions become mothers in their turn, and so it goes on, until in a very few hours their continued multiplication has resulted in the production of an indefinite number of them.

Hallier, who especially studied the microscopic fungi, states that every night a considerable number of these fungi may be found in the mouth and throat and the organs of digestion under the form of divided filaments like little chains.

But if, instead of throwing the mildew-spores on distilled water, we place them on a liquid rich in nitrogen, like the white of egg, gluten, &c they soon swell up, drop their zoospores, each of which produces a bud which detaches itself to become a mother and reproduce others, and so on in a process of multiplication without end.

To this form of spore, the name *micrococcus* is given ; it is to the budding of this fungus that the putrid or putrefactive fermentation owes its origin.

If the cells of the micrococci are spread on a substance poor in nitrogen, they then multiply by another sort of budding, producing the alcoholic fermentation, and take the name of *cryptococcus.*

If the spores of the penicillium are dropped into milk that has been boiled, to destroy any foreign germs it may contain, the same effects will be produced as if we had dropped zoospores or micrococci on a substance rich in nitrogen, and in less than two days the milk will sour and become curdled. When a small quantity of lactic acid has thus been formed, the fungus has assumed a new condition : the cells of the micrococcus swell up, as if to change into the cryptococcus, but with an entirely different result, for they elongate themselves into quadrilateral cells, frequently with square ends, and having a peculiar lustre, and multiplying by subdivision of little chains, they thus form the *arthrococcus* or divided cells, as we see them in the lactic acid of sour milk. (1)

If we now mix the spores of the penicillium with wine or beer which has undergone a thorough fermentation, by which all the sugar has been converted into alcohol, we have another sort of ferment, the form suitable to the production of vinegar.

Whence it follows, that the *penicillium crustaceum* is capable of furnishing 6 forms of cells differing from each other in accordance with the subtances to which their spores are applied, and each form producing a constant effect, always the same, on the medium in which it finds itself. So great is the rapidity of reproduction, that in less than 24 hours, one single cell can produce 400,000,000 micrococci.

After what has been said, it is clear that the seed of the penicillium can develop itself under six different shapes, that is :

1. By the multiplication of its own cells.

2. The cells produce zoospores or micrococci.

3. The micrococcus, in matters rich in nitrogen, multiplies itself, by budding, and produces the putrid fermentation.

4. The micrococcus, in matters poor in nitrogen but containing sugar, multiplies itself by budding, and produces the alcoholic fermentation.

5. The micrococcus produces partitioned filaments, which multiply by division ; and produce the lactic fermentation.

6. The micrococcus applied to liquids the sugar of which has been already converted into alcohol. develops itself in the form of little chains, and produces the acetic fermentation or vinegar. (2)

(1) *Arthron,* in Greek, is the socket or joint of a limb. *Trans.*

(2) *Coccus,* Greek is a small berry. Trans.

At the same time, we must observe that certain *savants* assert that these different fermentations are caused by different microbes, the seed of which are floating abroad in the air, and have nothing to do with the *penicillium crustaceum*. Fresh investigations are required to settle this point.

I shall, doubtless, be asked: but whence does the seed of the penicillium which produces the micrococcus come, is it brought forth by the simple alteration of the matters that contain it ?

To this I answer that the time has long since expired when people believed in spontaneous generation, such as bees being produced by the putrefaction of a bullock's entrails, &c.; *omne vivum ex ovo*, every living being comes from an egg or a seed, was the doctrine proclaimed by the illustrious Linnaeus, and since that time all conscientious *savants* have been of this opinion. If among the infinitely small, such as the microscopic fungi, the seeds generally escape a superficial investigation, they exist all the same, since, under the microscope, we see them develop and reproduce themselves before our eyes. Their extreme tenuity allows them to be carried in suspension through the air, and thence to penetrate into the bodies of animals, as well as into all liquids freely exposed to the air.

As we saw just now, the same cell is capable of developing itself into different forms according to the matters to which it is applied. Now, it seems that the liquids of our bodies contain an innumerable quantity of these cells which, far from being hurtful to us are indispensable to our health, but become the cause of disease if, by alteration, they are led to develop themselves into a different form. Such is the case with blood, milk, &c., the simple exposure of which to the sun for a few minutes is sufficient to bring about the development of the micrococcus, which quickly transforms the whole mass. Do the seeds of these ferments come from the air, or are they contained in the liquid itself ? Learned men are not yet agreed on this point; but it is certain that the assumption by these cells of new forms is never carried on except under the influence of free air.

That certain vessels of our body contain such seeds, we know from a very striking example, rennet the interior skin of the calf's stomach, which contains the spores of the lactic or butyric fermentation, and cause the curdling of milk in so short a time.

These spores are very tenacious of life ; dried, frozen, heated, provided the temperature of 212° F. is not exceeded, they do not seem to suffer at all, and they retain the reproductive power for a great length of time : up to three years and even more.

From what has been stated, it follows that if you wish to preserve your butter and cheese without alteration, you must not expose it freely to the air, from which it might imbibe the penicillium, the seed of the mildew, and thereby furnish to this seed a medium suitable to its development.

It is useless to add that the dessication or the proper salting of articles of food would protect them from the action of the seeds of the microscopic fungi, and frequently from the insects that infest them ; for in addition to their vegetable enemies, there are also animal ones against whose attacks the products of the dairy must be guarded.

The insects that are known to prey upon butter and cheese are the *acari* and mites, and the *larvæ* of flies.

I class butter and cheese together, though insects seldom attack butter, because the brine protects it from their assaults ; and when there has not been enough salt used, the microscopic fungi will be beforehand with the insects in invading the butter.

It is often remarked, that all insects undergo certain metamorphoses, that before entering into their perfect state, they must remain for a longer or a shorter term in the state of worms or larvæ. However, a great number of insects go through no such changes ; they *leave* the egg in their most perfect form, that in which they pass their whole life, except as regards the growth in bulk which age naturally produces. Nearly allied to the insects are the Arachnidæ, to which belong the acari, such a lice, mites, moths, flesh worms, &c. the kinds of which differ very much according to the species of animal or food they infest, and which are in general very numerous when they are met with at all. Horses, cows, sheep, dogs, hares furnish examples of this These parasites are generally called lice or mites. The name mite is particularly applied to those that devour our articles of food, such as sugar, flour, cheese, &c., but the true name of these is *acarus*. The scientifie name of insects is more important than may be believed ; for it is by means of this name that you will succeed in gaining information from writers on the subject of those enemies of whom you complain. And without the name, what guide have you in your researches ? How can you even understand those *savants* who have specially devoted themselves to the study of these little beings. The common every day names often serve to recognize the insects in the books, but they often contribute not a little, owing to the variation of their local names, to divert us from the true path of investigation, and make us follow a wrong road. Thus if you look for the word *Acarus* in the *Dictionnaires des Sciences* of Deschanelle and Foullon, you will find full information on the

animalcules. Bescherelle's dictionary, too, will tell you something about them.

The acari, mites, flesh-worms (*cirons*) or moths, as they are called are always very small ; hardly visible to the naked eye. Nearly colourless as they are, and having no crustaceous skin, they are not easily distinguished from the substances they frequent, such as cheese, flour, bread, etc. They differ from the true insects in having 8 feet instead of 6 : and in consequence, Latreille has placed them with the spiders under the head of Arachnidæ. They are nearly related to the *Trombidia*, the small bright, red, velvety spider, which we find so often on the ground in Spring.

The cheese-mite has received from Degeer the name of *Acarus domesticus*. This mite is distinguished from its neighbours by a pair of feelers, shaped like pincers. Some authors assert that this is the same mite that causes the painful skin-disease which we call the itch ; but it is understood now that the latter is very different, both in its form and in its mode of life ; its name, too, is different : *sarcoptis* (*Sarx*, in greek-flesh)

The cheese-mite is usually found on old and dried articles of food, as bread, dried or smoked meat, preserves, &c. Stuffed birds, and insects preserved in cases, are often full of them.

Like all other insects, the female lays a great number of eggs, and however little favourable circumstances may be to their development, their progeny may be counted by thousands and millions.

How to ward off their attacks ? The best way is to allow no remains of food, such as bread, meat, cheese, fish, &c., to be kept in the cupboard until they decay. Which answers to the rule so wise, so boasted of, and so often repeated, but not always observed--of perfect cleanliness in the kitchen and larder.

But the true insects, also, attack dairy-products, particularly cheese. Especially the flies. Flies undergo a complete metamorphosis. Three species are known to feed on cheese : the house-fly, *Musca domestica*, Lin ; *Musca putris*, Fabr. ; and *Musca Cesar*, Lin.

It is only the first of these, the house-fly, that we need fear. The fly, *Cesar*, has been met with in America, but too rarely to be reputed injurious. As to the *Musca putris* ; I do not think its presence has ever been observed in this country.

It would be a very desirable thing were our knowledge of these insects, their habits, and the means of contending with them, more generally taught ; for, in agriculture especially, we have to reckon with

them daily. The *cecidomyia* often destroys more than half our wheat-crop eating the grain in the ear ; the *agrostidæ* cut off the young plants of wheat, oats, tobacco, melons, &c. ; the weevils, *bruschæ*, devour the pease in the pod ; the *pieris napi*, ruins the cabbages ; the *halticæ*, feed on the turnips and radishes ; the *saperdes* gnaw the trunk of the apple-trees, while the *pyrales* eat into the heart of our apples. In a word, there is not one of our crops that does not serve as a feeding-ground to some insect, and which does not suffer, more or less, from its ravages. If we examine the interior of our houses, we still find a band of plunderers : lice in the heads of our children, bugs in our beds, flies everywhere, clothes-moths in our wardrobes, mites in our furs and woollens, black-beetles and cockroaches in our kitchens, gnawing and befouling everything they touch, &c., &c., &c. Again ; what a tribute does the insect race levy on us ! I should surprise you, perhaps, were I to say that their ravages must be valued at hundreds of thousands of dollars ! Well, I dare state that they amount to millions. If you wish to be convinced of this, take only one article and compute the loss. Take onions, for instance. There are 120,000 farmers in the province. It is certainly putting it below the truth to say that each farm has lost at least two bushels of this bulb by the onion worm, since, in many places, the cultivation of this crop has been entirely abandoned. At 50 cents a bushel, this shows an annual loss of $120,000 on this single article.

Now, if we knew more about the habits and the manners of these insects, we should have the means, not of exterminating them, but, of as least considerably diminishing the damage they do. I will only cite one instance.

The annual production of Canada is estimated at $200,000,000. At least 20 o/o of this is destroyed by insects : a loss of $ 10,000,000 by their ravages.

In every war, it is not always the surest road to victory to attack the enemy in full face. It often happens that the enemy withdraws himself from our encounter, and manœuvres so as to render of no effect the batteries which we have drawn up against him : *ruses de guerre* must be employed if we wish to conquer him. Now, in the insect we have a powerful enemy, it is in his millions that he invades our crops ; a numerous enemy, his name is legion ; an enemy often unseizable, on account of his manner of life and his tiny size. With such a foe then, we must employ craft, cunning, and artifice, and that these means may succeed, we must before everything thoroughly understand the manner of life of our adversary, the food which he likes, the retreats in which he lies hid, &c. In

this respect, we must acknowledge that information is almost entirely wanting to us : agricultural schools are still silent on this important matter. Visit them and look for their collections of useful and injurious insects : there is no such thing to be found ! I have already declared what I do not fear to repeat here ; on this point the schools have not done their duty. What is the good of showing splendid grain crops in the green-state, if we do not know how to insure their safety from insects that will destroy half of them, or more, before they ripen.

Do you wish for a very striking instance of what science can do in the war against the insect race ? The following happened in Ontario. In 1883, that province produced clover-seed to the value of $648,000. But, lo ! a little fly, the *cecidomyia* of Lintner, attacked this crop, laying its eggs in the heads of the clover the very moment they began to form. The little worm, when hatched, began at once to gnaw the seed, and at harvest, all that the farmers found was dry empty heads, so that at the expiration of the second year they were obliged to send abroad for clover-seed. How could such a foe be resisted ? Observation showed that, about the middle of June, the worms left the leaves to bury themselves in the ground, there to undergo their metamorphosis, and re-appeared, towards the middle of July just in time to lay their eggs in the second cut of clover, and thus to cause the loss of the second crop of seed, which is always the more profitable of the two. They then tried mowing the first crop earlier, but the bottoms of the carts were all yellow with the larvæ and cocoons which fell from the heads on to the ground, producing a new legion of enemies ready to attack the second crop. Some one then suggested that it would be better to feed off the first crop, and this plan met with perfect success. The stock while eating the young heads, at the time of their flowering caused at the same time the disappearance of the eggs and larva which infested them. How could such a plan have been adopted, if the behaviour of this little fly had not been previously known ? (1)

But to return to the house-fly, which lays it eggs on cheese when it finds any within its reach. When the egg is hatched, the little worm dives into the mass on which its feeds, and as each fly lays more than a hundred eggs, the whole of the cheese soon finds itself all riddled by these worms. They are yellowish these worms, and without feet, but they enjoy the power of jumping, approaching their extremities in such a fashion as to curve their bodies which then act as a spring. I once saw a cheese placed on the table when the soup was being eaten. The cheese was so

(1) In the Eastern counties of England, the first crop of red—and of white—clover has always been treated in this way for, to my knowledge, the last fifty years. A. R. J. F.

full of maggots that we observed quantities of them on the sides of the plate in which it lay, and so great was their agility that some of them jumped into our soup-plates. Several authors declare that these insects afford a very rich and appetising food, but none of our friends at table would consent to make a trial of eating them, and all agreed in begging that the damaged cheese might be removed.

The worm or larva when arrived at maturity, that is, after three or four sloughings of the skin (*mues*), leaves its retreat, buries itself in the ground or in some chink, and there spins its cocoon, inside which envelop a sort of egg with a rather tenacious shell, in which it becomes changed into a perfect insect, and leaves its abode by raising one of extremities of its prison through which it breaks without much effort.

The fly takes its flight through the air, in search of the other sex, and after fecundation, deposits its eggs in the place where the larvæ which will be hatched from them shall find suitable food within their reach. And so the process continues.

It is generally thought that the little flies one sees in summer so often are the offspring of the larger kind which the former equal in size when they have attained their complete development. This is a mistake, for flies, like every other insect that undergoes a complete metamorphosis, when hatched have attained their full size, and grow no more. The larvæ —be they worms or caterpillars—of all these insects increase in size ; nevertheless, this increase does not come to them insensibly as with other animals, but suddenly, by fits and starts. The larva, under the form of worm or caterpillar, eats plentifully, and consequently, the bulk of its body increases rapidly. But viewed from without, its volume appears to be the same, for the tough skin that covers it does not easily dilate. Suddenly the skins, splits open,and displays the new larva much larger than it was before and it continues to eat and grow until it sloughs off its skin once more. The larvae generally go through three or four of these sloughings, increasing in volume at each change of skin. When arrived at the last period, they pass into the *nympha* state either spinning themselves a cocoon or enclosing themselves in a sort of egg or *chrysalis*, whence, after a shorter or longer time, they emerge in a perfect state, with their wings and all complete.

Insects in general are only destructive when in the larva-state. And so it is with several of the Bombyx species, which when fully grown do not eat at all : some of them have not even a mouth to eat with. Their perfect state seems to be intended to insure the reproduction of the species by favouring the coition of the sexes.

Still, with insects which undergo incomplete metamorphoses, like the *hemipteræ* or bugs, the orthopteræ, grasshoppers, crickets, &c., it is very different. These insects begin their ravages the moment they are hatched, and continue them until they die.

It would be an easy task to teach the students from of our agricultural schools to distinguish insects according to their orders, and afterwards to know what they have to fear from their larvæ.

If time would allow, I would show you, even here, how every intelligent person who desires to understand what he sees, may know, at first sight, what he has to fear from any insect he meets with, and, consequently, what means he should adopt to contend with it successfully.

Since the meetings you hold every year aim particularly at the regeneration of agriculture by means of the dairy industry, I will here submit my views on certain points which are paralyzing the progress which we all have in view. My ideas are far from infallible, and are all open to discussion; but they, it will be allowed, proceed from a somewhat practical man, who has observed and studied much, and who is doing his best for the prosperity of our common country in seeking to regenerate its agriculture, ruined by an exploded and blameable routine.

And, to start with, I must tell you that I am opposed to the Council of Agriculture, to the commissioners of agriculture, and to the inspectors of standing crops, because I perceive too much political jobbery in all this: jobbery which seems to have no other end but the advantage of those to whom good luck has given a position in these dramas.

The council of agriculture seems to me to be a fifth wheel added to a coach, which far from increasing the rapidity of its movement, greatly interferes with its action. The government has an excellent means of getting information on agriculture through special committees of the house. I would, therefore, prefer to the council a commissioner thoroughly up to his work, with sufficient clerks to do their work properly. This would do much more good than the council.

I may say the same about the commissions of agriculture, which are another form of jobbery, in which the favoritism of political parties peeps through to the neglect of men who possess real capacity as agricultural advisers.

The same may be said of the inspection of standing crops, a costly business, whence no benefit has ever been derived, except to those who win the prizes, generally men whose wealth enables them to do better than those who do not possess the same resources.

In 1854, being then curé of St. Joachim, on the côte de Beaupré, I was invited to organize an agricultural association as there was nothing of the sort there. I drew up the programme in such a way that the prizes fell to the greatest produce per arpent. The first year, the prizes were awarded as follows : Harvested from an arpent : wheat, 19 bushels ; oats, 45 ; pease, 18 , hay, 377 bundles, &c. On all sides was heard the cry : " Wait a little ! See if I won't beat that next year. I'll take an arpent for wheat, another for pease, and one for oats, and give them special preparation." So the second year, the winning arpents were : "1st wheat, 34 bushels ; 2nd. 23 ; oats, 65 ; pease, 23 ; hay, 400 bundles, &c. Was not this real progress and within the grasp of all, since only an arpent of each crop was taken ? And the piece that produced 34 bushels the arpent, would it not remember the treatment is received for 5 or 6 years ? If each farmer would undertake the improvement of only 3 or 4 arpents of his land yearly, would not that be a real and promising sign of progress !

As for the agricultural schools, I do not wish to hurt any body's feelings here,but permit me to say,I do not think they have done their duty.

Some years ago, I advised the Department to present to each subscriber to the *Journal d'Agriculture*, which, be it said in passing, is admirably conducted and very useful, a plan of each of the farm schools, explaining thoroughly the situation, the nature of the soil, and so on, of each field ; and to relate every succeeding month the work done on it, the brairding of the seed, the harvesting of the crop, any accidents that may occur, &c. In this way, every subscriber would be able to follow, at home, the operations conducted on a model farm, and to assure himself of their successful issue. But it was not thought advisable to do this. Fear of making public a compromising want of success was probably the cause.

Why is not botany taught in these schools, as well as the grafting and pruning of trees, and a knowledge of destructive and useful insects ? These are points which are not to be neglected in agriculture, especially when the object aimed at is to form model farmers.

An experimental farm has just been established at Ottawa; but in this, as in many other things, the French-Canadians seem to have been forgotten.

You will kindly observe, gentlemen, that I have only glanced at the above ideas, without allowing myself time to develop them properly. I am well aware that they will not meet with the assent of all my hearers, but no one, I think, will doubt the purity of my desire to accelerate the progress and develop the resources of our fine and wealthy country, a country of which we have every right to be proud, and which cannot improve and prosper save through the progress of its agriculture.

NEW EXPERIMENTS ON ENSILAGE BY Mr. L'ABBÉ CHARTIER.

At a meeting at Three-Rivers, last winter I described to you, in reference to ensilage, some experiments I had previously made, and I intimated at the same time that I would relate to you this year another experiment I then proposed to make, I will now proceed to tell you of the results of this experiment.

In making ensilage, I did not desire to follow the teaching of books on the subject. I thought that we could afford to run the risk of a complete failure, and I incurred that risk, in order to find out the way of making ensilage at the least expenditure of work and money, that the objections of those who fear that the cost might be too great or the labour too fatiguing might be obviated.

At Three-Rivers, I told you that having the previous year put nothing but straw on the silage, we lost about twelve inches of the upper layer, it having become carbonized.

To be successful in preserving our corn silage, it was clearly necessary to find some other way of proceeding. This year, I made a trial of one. We put a row of unplaned planks on the ensilage, after it had become heated up to 130°F. and placed eight inches of earth on the planks. With our manner of filling the silo, it takes about an hour to cover the ensilage with eight inches of earth, for we fill in the corn from above, by means of a box, raised by a horse, for which purpose a pulley is fixed to the ridge-pole.

I made another experiment this year. Last year we only worked for one day, and waited until the heat of the silage had mounted to 130°F. But this delay caused us to run the risk of being caught by the frosts. This year we have tried the experiment of working for a day and a half. We began at noon, and continued till the evening of the next day, and then waited till the silage showed 130 degrees of heat. In this way, we succeeded in ensiling 60 tons of corn in 4½ days work, working at three intervals. As the layer generally takes two days to heat up to 130°F., the two first stents were done in the same week, and we were able to finish the following week.

Having thus ensiled our corn during the early part of September, we found ourselves safe from all danger of getting it frozen.

The question of the door remains. Last year, besides the loss of the upper twelve inches of ensilage, which, from being left uncovered, were carbonized, there was a considerable loss at the doorway, (there were from 15 to 18 inches spoiled across the whole width of the door, though less in the middle) and at the sides, wherever there were joinings.

All this I was anxious to get rid of. This year we shut the door before we began, and filled the silo through the gable. Using our box made this less difficult, and we did not lose any time by it. The door having been closed before beginning to fill in, we could tread down the sawdust between the two linings regularly, from the bottom to the top.

Now, I may tell you that with this covering of earth above, and with the closing of the door before beginning, we did not lose a basketful of silage ! All of it was bright, and had the silage smell ; not the least taint of mouldiness.

In consequence, I am prepared to state that pressure on ensilage is not necessary.

I do not think it is even useful ; for I believe that without it we have obtained as good a quality of silage as can be desired.

By these experiments, we have it at any rate in our power to say, that it is no longer necessary to lift 5 or 6 tons of stone to the height of 10 to 15 feet ; we may be satisfied with putting on a cover. As a cover I used earth ; perhaps, I might as well have added tarred-paper.

The whole success of ensilage depends on the exclusion of the air. Steps must be taken to prevent at least the circulation of the air.

But it will be said : how comes it that corn cut into lengths of three lines, and thrown into a small building, compacts itself sufficiently to exclude the air ? I reply : by the heating and the fermentation. When corn heats up to 130° F, it is thoroughly softened, and you can perceive it sink. It presses itself together by its own action, and sufficiently so to arrest the circulation of the air, if not to exclude it altogether.

I can state, gentlemen, that by the observance of this fundamental rule of excluding the air, and I even believe by simply using something to arrest the circulation of the air, we can obviate any loss at the top of the silo.

I shall try no experiments next year. All we have to do is to put the earth on the silo, and this earth is very useful to mix with our manures. I shall go on as before until some new discovery is made, and I feel sure of being succesful.

As to the value of ensilage, I will repeat here what I have previously said in other places : every farmer ought to try to make some. It would oblige them to have chaff cutters, which are very useful implements. It will not take you long to pay for one, if you cut up all your fodder and mix the different kinds together, not feeding out straw alone but hay and straw together, and something else with them if you have it.

At St. Hyacinthe we have certain advantages. Our cows pay us better in winter than in summer, in spite of the expense of wintering them, because we have a sale for the milk. I cannot say how that would pay in the country, but a cheese maker told me the other day that his milk, converted into cheese, payed him $2,00 a hundred.

Well ! for my part, I have done well at $1,60, but admitting that what the cheese–maker told me was true, I believe that cheese making in in the country during winter would be profitable.

Believe me that if you have 50 or 60 tons of ensilage to give your cows, even whithout any meal, they will not be in bad order in the spring. Cows generally calve before going out to grass. Supposing then that a cow calves in March, she will not be at grass before the end of May, and she does not pay you well in the stall. But if you have fed out 25 or 30 tons of ensilage to your cows during the winter you will reap the benefits of it in spring. Your cows will be fat, in good health, and ready to return you a good profit until the grass is dried up in the pastures. You know well that the entire season of profitable cow-keeping by those who do not take good care of their stock only lasts from the beginning of June to the end of July. But even if you only had the advantage of drawing a good profit from your cows from the month of March up to the grass-season, I believe that profit would pay you well for the pains you had been at in building a silo,

As to the construction of a silo, enough has been said about it, and there is no use in going over it again, but you know now, that a man who can use his hands can build a silo for an outlay of $25 to $30. So that it is not worth while to be without one.

Of course, some one will object, that to make silage properly a chaff-cutter is necesary. If you ever have a chaff-cutter, I hope you will not use it solely for ensilage, but cut up all your fodder with it.

A man alone cannot undertake this work of silo-building, but one with children can do it, and the economy of the fodder. and its greater-value, will pay for the chaff-cutter the first season ; for all the different sorts being mixed, the animals will digest their food better, they will enjoy better health, and, consequently, give greater profits.

CONSTRUCTION OF THE SILO

Mr. Archambault.—Will Mr. Chartier tell us how much a silo for ten cows would cost ?

Ans. You will be satisfied, I presume with three tons per cow for the winter ? Mr. Archambault. Yes.

Mr. Chartier.—I reckon that a silo to hold 30 or 40 tons ought not to cost a *habitant* more than the price of the wood and nails.

Mr. Archambault.—Will you kindly give us the details ?

Mr. Chartier.—Take 12 x 15 feet for the superficial measurement by 12 feet in height. If the conditions are favorable, it would be well to make it higher ; but when it is necessary not only to build on the surface but even on a slight mound, twelve feet is sufficiently high.

There must be four ground-plates (*soles*). You know, better probably than I how much 50 feet of these would cost. Thy should be of red-spruce, if possible.

These ground-plates I would advise to be bolted with iron, and posts should be bolted to the plates with iron, too. Iron of $\frac{3}{4}$ inch is sufficient. It is important that nothing should break, and the difference of price is not worth attending to.

I should lay wall-plates (sablières) which need not be very stout —4 x 5 is enough—and bolt them also with iron, so that the whole frame will be iron-bolted.

Now, for a length of 15 feet, I do not think it necessary to strengthen the wall-plates. Still, if the builder fears that they are not solid enough, or if, when the silo is filled, it begins to *give* at all, a joist bolted with iron, may be placed on the top. With a frame such as this nothing can shake the silo.

Now a separation must be made, that is, what I believe are called scantlings must be placed every two feet to prevent the boards from giving way. The dimensions for a building like this may be 2 x 6.

The door should be three feet wide, to allow of the passage of a man with a basket.

And now about the roof. The farmer can choose what kind of roof he pleases, ours is made of boards : some would prefer one covered with shingles.

If the silo be made in a building, the barn for instance, it would not cost as much as I said.

Mr. F. Dion is present, from St. Thérèse. He has a silo in his barn, and will tell you how he set about making it.

Mr. Dion is one of the pillars of our meetings. I am glad to congratulate him before the whole of this assemblage. I do not believe he has missed one of our meetings. He does not care for the expense ; he does not waste his money, but he finds that his time and his money are well spent in attending our meetings.

As for me, I have no silo in the barns.

Mr. F. Dion.—My silo is a very simple one. It is part of the interior of a barn that I chose, and I raised a square frame in it with posts 3 x 6. The corner posts are bigger. The whole is joined together at the top, as Mr. Chartier explained just now. I put two ranks of boards, one upon the other, all round, to hinder the air from penetrating. There is no stuffing of sawdust.

Mr. Archambault.—Several gentlemen have asked me how my silo is constructed. I have two, but I consider they cost too much, and that is why I asked Mr. Chartier what a silo, built with the greatest possible economy, ought to cost. I said that a silo for ten cows might cost from $20 to $25, at the most, if one had the necessary wood ; do you agree with me ?

Mr. Dion.—The Rev. Trappist Fathers are present. They say they built one for $20. Theirs measures 16 x 16 x 16.

Mr. Archambault.—One of my siloes measures 21 x 16 and is 12 feet high ; the other is 6 inches less in length. They cost me $50 each, but I had to buy everything, and, being absent from home, I had to employ men to do the work.

Mr. Dion.—I have calculated everything ; the wood and the frame, which I had prepared, and my silo cost me nearly $80.

Mr. Archambault.—I have two ranks of tongued-and-grooved boards.

Mr. Dion.—Mine has only one rank of tongued-and-grooved boards. The other rank is of boards with squared-joints.

Mr. Côté.—Is that as good as if they were tongued-and-grooved ?

Mr. Dion—My corn is perfectly well preserved, and I use neither paper nor sawdust.

THE CULTIVATION OF INDIAN CORN FOR GREEN FODDER

By M. L'Abbe Chartier.

I do not propose to offer my system of cultivating corn as a model to be necessarily imitated. I am convinced that there are some who do it much better than I, and who probably reap much better crops thereby.

As the land is never too rich for corn, and as it generally pays us in proportion to what it has received, I make a practice, as much as possible, of folding my cows at night on the piece intended for corn. We first take a piece of land, about half an arpent in extent for 35 or 40 cows, so that, although there is sufficient room for them, they must lie down to rest pretty near each other. We have a fence that is moved back as soon as the land in the fold is sufficiently manured. In the course of the summer, we generally manage to manure 3 or 4 arpents. After a few days, when the night fold has become two confined, it is about time to change its position.

I have already grown corn with this dressing alone, and it was superb, but sometimes we add more before ploughing.

We give a good deep furrow.

If we have had time to plough early in the autumn, a spring furrow is unnecessary. For by early ploughing the roots of the weeds may rot during the winter. It we have ploughed late, I generally plough again in the spring, but only just before sowing the corn, in order to allow the roots of the weeds to spring up before stirring the earth. It is of the greatest importance to destroy as much as possible of this growth, as it is a great source of trouble to us : the richer the land, the greater the trouble.

When we can, in this way, avoid spring ploughing, by an early autumn furrow, we give the land a good stirring with the grubber. It is important to pulverize the soil as much as possible.

We level it with the harrows, and when this is done, we make the drills, with an ordinary plough, about three inches deep. A little boy following the plough, sows the corn. A bushel an arpent is about a usual seeding for ensilage.

Other corn we sow thicker, about $1\frac{3}{4}$ bushels an arpent, to prevent its growing coarse. This we cut for green meat for the cattle, when the grass is beginning to dry up or harden.

We cover in the corn with a rake. Last year I did it with a sort of double mould board plough used for earthing up potatoes, and it answered famously. This job only took half a day to do four arpents.

We do not sow broadcast. There are people who, having sown corn broadcast have reaped splendid crops, but do not let them trust too much to this plan. Sooner or later, they may be sure, a cold spell of weather will befall them in June, and then, however well prepared their land may be, the weeds will overpower the corn, and there will be no crop. No help can be given, by horse or hand-hoe to broadcast corn.

For our silo as it is arranged at present, we require 4 arpents of corn. The plough makes the drills, and a small boy sows the corn.

We intend to sow 7 arpents with 6 bushels of corn. But I have proved that the bigger the corn is the more, in proportion, it weighs, and the better it is for the silo. When sown thick, corn grows spindly, and weighs less.

The Western horse-tooth corn produces ears that are not to be despised among silage. Almost every good sized stalk bears one ear at least, and we cut it when the grain is in the milk state, or just beginning to harden; it is then in good condition to be given to the stock.

Next, comes the hoeing. When the season is favourable, we succeed in clearing the ground with our horse-hoe, and can do without hand hoeing.

Corn is a plant that starts slowly, doubtless because it has many roots to form; but, from the moment the roots have taken a good hold of the land it grows rapidly. Then, when the season is propitious, and the corn does not linger too long in the ground before showing itself, we can do the business with the horse-hoe. If the corn takes long to break through the ground, it is better to use the hand-hoe as well: the use of it is profitable.

The moment corn attains the height of two feet or two feet and a half, the work of hoeing must stop. Besides, there are no weeds then.

At the Seminary, we pay for all the labour employed on the farm, and our cultivation is not done by lavish expenditure. Farmers can do as we do, but we cannot do as they do. Come, and pay us a visit at any time, from the first day that work is possible on the land until the last, and you will find all our people at work. Let a farmer show me that he does as much. We cannot do as the farmers do, but they can do as we do. We farm after a practical fashion; we take all possible care of the manure, and we try to do our cattle well during winter that they may go out to grass in good order in spring.

There is one thing against us: we have no good pastures, for the land when we took it was in a dreadful condition. I hope in time we shall succeed in improving them.

But I fear I am setting you against me; pay us a visit, and you shall see how we get through our work: it is by working every day.

CULTIVATION OF INDIAN CORN.

Mr. Casavant.

L'abbé Chartier has requested me to give some account of my

manner of growing corn. The plan I follow is a very economical one, and will give it to you in as few words as possible.

The piece I selected for corn, last year, was the night-fold for the cows. I did not plough the land until just before sowing.

I sow corn from about the 15th to the 20th of May. If the spring is a warm one, it may be sown a little earlier. I prefer waiting for warm weather, that the corn may start into growth as soon as it is in the ground.

As soon as the land is ploughed, I harrow the surface lightly, and sow with the seed-barrow, leaving 13 or 14 inches between the rows, that there may be room for the hoe to pass.

The land having been newly ploughed, when the seeding is done there are no grasses or weeds ready to grow.

Moreover, the land remains light. In land ploughed and stirred at once, vacant spaces remain under the surface, so that although rain may follow, the soil does not jam itself together, and the corn does well.

For 15 years I have been growing corn for my cows, and I find this the most economical plan to follow.

Again ; as to growing corn for green-meat, it is advisable to sow it at intervals, that the stalks may be all about the same age when they are given to the stock. If you sow the whole of it early, part of it will be too old and hard : good for the purpose of ensiling, but not fit for cows at pasture. But if you sow some on the 15th of May, and the rest at the end of that month, or even at the beginning of June, your corn, when the cattle get it, will be always young and fit for green-meat.

Mr. Timothée Brodeur, St. Hugues.—How do you cover in your corn ?

Mr. Casavant.—The seed-barrow I use does that as it proceeds. With it, we can sow from 1½ to 2 arpents a day. I sow about 1½ to 2 bushels per arpent. The corn is only fit for green-meat.

I can assure you that it is hardly possible to follow a more economical plan of growing corn.

This year, I am certain that it has not cost more than a day's work of a man for each operation of sowing and hoeing, and the land is perfectly clean. Only a few weeds showed themselves during the summer.

I have discussed this point with Mr. Brodeur, who ploughs both in autumn and in spring. I have tried his plan, and here is the incon-

venience of it : if the land intended for corn has been in meadow or in pasture, or has been used as a night-fold for cows, and has not been ploughed sufficiently early in the autumn to allow the turf to rot completely ; in the spring, if a moist season happens to come, the weeds start up, and you cannot get rid of them.

In the West, they stir the land with the grubber before they sow the corn, and that is all the cultivation the land gets.

And this is all that my plan requires, except a slight harrowing, so slight that the buried weeds and grass are not brought up to the surface again.

The cultivation of corn in this way is not expensive ; you are sure of a good crop, and the rain does not injure the land at all,

I advise you all to try this system ; it is the best way of convincing yourselves of its value.

A Voice.—The grass you plough under, is it injurious to the corn-roots ?

Mr. Casavant.—We had a dry Spring this year, and my corn-crop was splendid. Mr. Frey, a young Frenchman, who has studied farming in France and in England, told me he never saw a piece of fodder-corn finer than mine.

The Spring was very dry. When it is moist, the corn, cultivated after my plan, is safe from the invasion of weeds.

For fodder corn, I have the rows at 13, 14, 15, or more inches apart. I believe in sowing fodder-corn thickly.

I agree, besides, with Mr. Chartier in what he said on this subject. If you sow corn thickly it is more difficult to work ; if you sow it thinly, it has more substance, and is better for the silo.

But I speak of its use as food for cows at pasture, and I say corn should be sown thickly, that the stalk may be tender and, therefore, entirely consumed by the cattle.

My corn, when it grows coarse, the cattle refuse it ; but, on the contrary, when fine and slender, it is all consumed.

Mr. Brodeur.—I proceed to tell you how we grow corn.

I take a piece of land, as rich a piece as I can find, night-folded or manured in some way. I plough it in the fall, and, in spring, I make the drills with the plough, from 16 to 20 inches apart, laying the plough flat, so as to make the drills as wide as possible.

In sowing, I proceed just as if I were sowing broadcast a ridge of

pease, eight feet in width, at two casts. A stroke of the harrows, and the operation is finished. Is that economical and expeditious enough ?

I use about two bushels of seed to the acre.

It is now the eighth or ninth year since I began to sow corn, and I have always followed, nearly, the way I have spoken of, only improving on it : my improvement consists in getting the work done faster and faster.

From centre to centre, my rows are about 18 or 20 inches, but my drills are about 6 or 7 inches wide ; I like to have them wide, that the row of corn may be large. I leave enough room for the passage of the horse-hoe. I go a *bout* in every row. After that is done, I draw out my furrows, and water-furrows, and that is all.

When the corn begins to show itself, after hœing I plaster it, and if I see any weak spots afterwards, I plaster them again.

I keep from 30 to 40 head of cattle ; I have a silo for winter-supply ; and in this way I succeed in growing ensilage-corn.

I do not say this to contradict Mr. Chartier, but simply that you may form your judgment on the different ways of growing corn.

Though I was not able to do it this year, when the corn is fit for the silo we cut it with a harvester : it all falls in heaps.

As to my silo, it is made like Mr. Chartier's, only we use stones instead of earth. I think earth is better.

Mr. Côté.—How many tons of corn do you grow to the arpent ?

Mr. Brodeur.—It is difficult to say ; but we get a good deal.

Mr. Taché.—How much corn do you grow ?

Mr. Brodeur.—Rather less than four arpents.

Mr. Taché.—How much silage does that give, measured in the silo ?

Mr. Brodeur.—I ensile from 55 to 60 tons of corn. My silo measures 20 x 13 x 15.

Mr. Côté.—Does Mr. Casavant grow as much ?

Mr. Casavant.—I must say, that it would be difficult to get more corn than I do. It is generally 12 or 13 feet high, and very thick in the rows. But to close this discussion, I will say that the system to be adopted is that most suitable to the soil.

On my farm, there are neither open nor water-furrows; the land is all laid flat, in ploughing, and is either naturally or artificially drained. But Mr. Brodeur farms his land in accordance with its nature. It is stiff land ; perhaps, if he were only to work his land at the season when I

work mine, it would be too compact. Light, porous soils preserve the moisture and resist drought much better than stiff soils : the latter dry up and become as hard as a brick.

For my part, I am convinced that my plan is the best for my soil and I shall stick to it.

Mr. Frs. Couture.—Will you tell us, please, Mr. Brodeur, how high your corn generally is.

Mr. Brodeur.—About 10 or 12 feet. It depends entirely upon the thick or thin sowing of the seed.

Mr. Couture.—We, too, grow a little corn, and I will try to describe our system. Mr· Chartier said just now that broadcast-work was never successful.

L'abbé Chartier.—I did not quite say that broadcast-work always fails ; but that we should not practise it, even if it answered one season.

Mr. Couture.—Any how, this is how we do the work.

Our soil is sandy, and pretty rich ; we cart out manure, which has rotted during the winter ; this is done in the fall. Then we plough the land.

Those who have spoken before me do not mention a practice I have always followed ; that of steeping the seed-corn to accelerate its germination.

We sow corn broadcast, and thickly ; then, we harrow it only, and roll it very well. And we succeed capitally.

The stalks touch each other, and run about eight or ten feet in height. The weeds are destroyed by the corn.

L'abbé Provancher.--Some one said just now that ploughing down the grass, as Mr. Casavant does, warmed the plant, I feel I ought to say that this warming of the plant does not injure it, but, on the contrary assists its growth materially. The skin of corn is very hard, and if warmed it will germinate all the more rapidly.

In Illinois, I have seen the farmers break up virgin prairies, which had borne grass for centuries, and when the furrows were turned over, they made a hole with an iron dibber and put the seed into this hole. This must heat immensely and still the corn succeed marvellously well.

Besides, if you immerse a grain of corn in boiling water, it does not lose its germinating power.

M. Marsan.—Since every one has given his opinion on the cultivation of corn, I am tempted to add my voice to the concert.

I have made experiments in growing corn during the last few years, and am perfectly satisfied with the results. In every point I have followed Mr. Brodeur's plan.

Still, the first year of my trials, I sowed part of an arpent broad-cast, and I will tell you how I went about it: the land had been dunged and ploughed in the previous autumn; in the spring, after well harrowing it, I soved 6 pecks to the arpent, broadcast, and ploughed them in with a light furrow. When the corn was about 2 inches high, we gave a harrowing with light harrows, across the furrows, to prevent the growth of weeds and grass.

In every instance, whether in rows, after Mr. Brodeur's system, or in broadcast work, we obtained the same results.

But, as Mr. Chartier said, broadcast work may have its dangers. I understand him; for the broadcast corn had more grass among it than the other, though the former, having conquered the grass, gave good returns.

Last year I sowed the same quantity of seed to the arpent, but the summer was drier, and our crop was not so good. It may be, too, that the crows injured the yield by carrying off some of the seed.

The corn I sow is the Western horse-tooth corn.

REMARKS ON THE CULTIVATION OF MANGEL-WURZEL

L'abbé Chartier

I am not about to deliver a lecture to you; besides, I am not mentioned in this part of the programme. I have myself requested leave to be allowed to address a few words to you.

I have lately seen in the English edition of the Journal of Agriculture a criticism on certain statements I made last winter, at the meeting of the Dairymen's Association at Three-Rivers.

And in the first place, I did not intend to lay down the law to any one,I only stated how much the cultivation of the root-crop cost us, and to speak with exactitude, how much the mangel-crop cost. I spoke of nothing else, because we have not succeeded in growing any other roots than the mangels, turnips having always failed with us.

Then, talking about ensilage, I said, that for my part, I should give up growing mangels, since I found that corn cut green and ensiled, well

kept, proved to be of the same value, weight for weight, for milch-cows, as mangels. Having weighed the mangels which we were giving to our cows, and the silage weight for weight, we found that when we fed on silage after stopping the mangels, the milk of our cows did not fall off; and after a few days of silage, it increased. Whence, I conclude that for our purposes corn being much less costly to cultivate than mangels, we ought to abandon the growing of mangels and cultivate corn.

Mr. Jenner Fust, who is a great amateur of roots [and I think he is right, having been born in England where they use large quantities of roots for the stock,] was not pleased. He thought I was declaring war against root-growing. But that was not my intention. If, in reality, we could grow roots at the cost he mentions, I should be the first to return to their cultivation; not exclusively, for I hold firmly to fodder-corn ensiled, but I should grow roots, especially for the sake of providing cattle-food during the months of October and November.

Mr. Jenner Fust asserts that an arpent of mangels can be cultivated i. e. all the work of hoeing, singling, and *démariage* [the word, perhaps, is not French, but it in use among us], for three dollars an acre. The seed is not in question. I wish to submit this matter to the meeting, in case there should be any one among us capable of teaching us the mode of this cultivation which, unfortunately, give not Mr. Jenner Fust does.

Mr. Guèvremont, a pupil of Mr. Jenner Fust, at Sorel, declares that he has grown mangels, and all the work cost him was $3.40 an acre.

To me, these are unheard of things. Since I have been superintending the farm of the Seminary at St-Hyacinthe, I have had occasion to employ men of different working capacity. But for four years, I had in my service a most industrious Frenchman, one who knew perfectly how to do farm-work, how to use the hoe, was never troubled with a pain in his back; a man who worked from four o'clock in the morning till seven at night, and who never stopped except for his meals, and twice a day for the time he took to fill and light his pipe (not to smoke it). Well, this man was never able to single (*éclaircir*) an arpent of mangels, in less than six days. But, then, I am speaking of work thoroughly well done.

For, if you want to succeed in the cultivation of mangels, to get a return that will repay you for your trouble, you must leave each plant separate: and that is a serious piece of work. If you leave two plants touching each other, you will have two mangels as big as your finger.

Now at Three-Rivers, I stated that I could not cultivate an acre of mangels for less than twelve dollars. Remark that I do not speak of

the preparation, sowing, &c., but only of the work done after the seed is sown. At the Seminary farm, it is easy enough to know what work costs, for we have to pay for all that is done. It is not the same with a man who has a family, He gets a good deal done by his wife and children, of which he keeps no account. But he who cultivates a farm entirely by paid labour, can easily, if he pleases, find out the entire cost.

Now, striking an average (it is possible that, in some seasons, the cost speak of has not been so great, for in some years weeds do not grow so fast as in others), of the last six years, mangels have cost us twelve dollars an acre to cultivate.

I do not mean to say that this is the universal cost. But if any one will offer to undertake for me the care of an arpent of mangels after the sowing is done, for three dollars, I will thank him, and return to the cultivation of mangels for a certain length of time.

Some one in the audience there may be who has discovered the secret of singling by chopping out (*à la tranche*) or otherwise, the rows of mangels.

We have 98 rows on the width of an arpent, and a man takes six days to go over these rows and single the mangels. We must not conceal from ourselves that, for mangels, hoeing with the horse-hoe will not suffice. The hand-hoe must necessarily be used, for with the horse-hoe, the mangels are in danger of being cut. Besides, to grow a paying crop in a rainy season, three hoeings at least must be given, if we wish to prevent the grass from taking possession of the land and injuring the crop.

N—B. In all fairness to Mr. A. R. Jenner-Fust, it must be stated that a practical demonstration of his method is offered to be made, in St. Hyacinthe and Sorel, next spring (1889) by Mr. S. Guèvremont, Mr. Jenner-Fust's pupils. J. DE L. TACHÉ, Sec.

THE CULTIVATION OF MANGEL WURZEL

MR. CASAVANT

Mr. President and Gentlemen.

I shall not detain you long; I am only about to say a few words on the cultivation of mangels, in support of the address of l'abbé Chartier.

Mr. Chartier tells us that Mr. Jenner Fust, in the Journal of Agriculture, asserts that mangels can be cultivated for $3.40 an arpent. It would

be of great use to the country if the secret of so cheap a style of cultivation could be revealed to our farmers.

A short time ago, I had the pleasure of meeting Mr. Denis, agricultural superintendent of the Berthier sugar-factory ; he told me that he put the cost of the cultivation of an arpent of mangels at $12, including the singling by hand. So that his valuation is lower than that fixed by the Abbé.

For my part, I think the cultivation of mangels might be done for $8 or $9 the arpent. It is absolutely necessary to give the land two good *grubbings*, for a superficial stirring is not enough. If the upper stratum of the soil is not broken up sufficiently to admit of the air penetrating into the subsoil, the crop will not be so large as it ought to be. To save a few dollars of outlay, and, on the other hand, to lose half the crop, is not economy. What is needful is to get the greatest return possible.

Mr. Chartier fixes the cost of this cultivation at not less than $12 an arpent. I have no doubt that when it is carried on under the superintendence of others besides the proprietor, it costs still more. By doing the work one's self, something may be saved. But, at all events, we cannot calculate on getting it done for less than $8 or $9 an arpent.

As to the nutritive value of mangels, there is an enormous difference between the different kinds of the root. The great beet, which is called the field-beet, is, I am certain no better than ensilage. But if you grow the little white beet, which yields from 15 to 20 tons per acre, you will find it much better in quality. It is very different from the other, so that all depends upon what species of beet you grow.

For my part I should not advise people to give up root-growing. As Mr Chartier said, they are very useful in the months of October and November, when the siloes are not ready, and the summer-swath (*coupe d'été*) has failed. There would then be a good lot of fodder at the season when the pastures fail, though the cows still retain their milk-giving powers, and this milk is the richest of all the season. It is then that roots are of the greatest use.

In a word, I only spoke to support l'abbé Chartier.

Mr. Denis.

Mr. *President and Gentlemen*,

I am not here to make a speech of any kind, and still less to make a fine speech. I am going to speak of the beet-crop. I came to this country to promote the cultivation of the sugar beet.

The lecture, so practical and well expressed, that the abbé Chartier has just delivered, confirms me in several conclusions which I have drawn during the six years I have been in the country.

Still, $12 for hoeing and putting in order an arpent of beets seems to me to be an exaggeration ; though not so great an exaggeration as the Journal of Agriculture asserts it to be. For this work, women and children may serve, and their work is not so high-priced as the work of men.

In France we pay for singling by hand (*l'arrachage*) $24, the *hectare*—nearly three arpents. Here, I calculate, it should cost a little more. For hoeing, you would have to pay $8 or $9, and I suppose you might single them by hand for $12.

I do not come here to make any claim to support for the sugar-factory ; but you will understand that I cannot allow this occasion to pass without saying something about it. The factory is in the hands of men of means, men on good terms with each other, a thing that has never been the case before, and it is under the management of an experienced director, who has gone to Europe to buy the implements and apparatus for the manufacture of beet-root-sugar. I trust we shall be able to fetch beets from this side of the country. To enable us to start, we wanted a small bonus from government, and we hope that in the coming session—at least Mr. Mercier gave us to understand as much—we shall receive a small grant to enable us to pay a higher price per ton for the beets. Certain farmers complain hat we do not give enough for the beets' and they complain, as well, that they are not familiar with their cultivation.

Gentlemen, I am not accustomed to public speaking, and I feel that you must have soon found that out. But I hope that your kindness will rise to the level of my incapacity.

Shortly, I thank you. I am confused by your good will and kindness and will no longer detain you from listening to addressses much fuller of instruction than anything I am able to set before you.

L'abbé Chartier.

From certain remarks that M. Casavant made, the meeting may be under the impression that, when I said that I had given up the cultivation of mangels for that of corn. I meant that I had thrown aside the cultivation of garden crops (*jardinage*). I did not at all mean that. We used to grow quantities of mangels, enough for our cows during the whole winter ; I found that it was more economical to growcorn, which according to my experience, has the same value weight for weight, as mangels. And when I speak of *betteraves* (*beets*) I mean *la betterave des champs*, *la betterave à vaches*, (*mangels*) ; I do not speak of the *sugar-beet* (*betterave à sucre*).

I do not wish you to be under the impression that I want to put corn into the place of all others kinds of garden-crops (*jardinages*). At the Seminary, in spite of the change pointed out,we still have quantities of garden crops though we no longer grow turnips.

THE PHYSIOLOGY OF DIGESTION.

M. President and Gentlemen,

The subject on which I am going to address you to day is only indirectly connected with the Dairy-business. But, as we are all here for the purpose of learning everything that is in anyway connected with agriculture, properly so called, or with the treatment of animals, I believe I shall be of service to the meeting if I expatiate a little on the subject of.

THE PHYSIOLOGY OF DIGESTION

Such is the title of this lecture.

As I wish to treat this question from a practical point of view, I shall avoid the use of scientific terms, the expressions I make use of shall be those that are understood by everybody, and I shall speak only of what may be useful to you in your every day labours.

THE IMPORTANCE OF UNDERSTANDING THE PHYSIOLOGY OF DIGESTION

You understand, gentlemen, that in order to make a machine do its work properly, it is necessary to understand its parts, individually, and their particular use.

Now, an animal is a complicated machine that cannot be made to work profitably, or at least without danger to itself, unless its organs and their functions are, at least superficially, understood.

The animal machine comprises several parts or organs, such as the organs of digestion, of respiration, of reproduction &c.

These different organs are connexions of each other, or rather they are one and indivisible (*solidaires*). If one of them gets off the rails, the others suffer from the error.

But the one that, under the ordinary circumstances of life, presides over the others, is the organ of digestion.

It is the stomach and the other organs of digestion, whose duty it is to furnish the other parts of the organism with the food necessary to their existence,

You see, then, the importance of understanding a little, at least, about the mechanism of these organs.

Let us see 1st. what the phenomena of digestion are, and then, 2nd what practical deductions drawn are to be from them.

The first process of digestion takes place in the mouth, the second in stomach, and the third in the intestines.

Mastication—This is a very important point. It is more so to the horse than to ruminants, on account of his having only one stomach and that a small one. Behind the ear, there is a gland, called the parotid gland. During mastication, there exudes from this a great quantity of saliva, which mingles with the chewed food, and is indispensable to its preparation.

An hour and a quarter are required for the proper grinding or mastication of a quarter of a bundle of hay, and for its getting mixed with a suitable amount of saliva.

This is not enough when the teeth are irregular, when the animal is old, or if it has a gluttonous appetite.

If the mastication is imperfect, the food does not undergo the proper transformations, and settles in the great intestine, where it remains.

Insalivation—According to Colin, the *salivary glands* of a horse in good health, and endowed with a good digestion, produce during mastication four times as much saliva as the hay given to him. For instance : for 15 lbs. of hay, 60 lbs of saliva ; $\frac{1}{3}$ more for oats, i, e, $5\frac{1}{3}$ times as much : For instance : for 10 lbs, of oats, 53 lbs. of saliva.

While an animal is not eating, the glands secrete 2 ounces anhour : $4\frac{1}{4}$ lbs. in 18 hours, or a total of 117 lbs. for the 24 hours. You see, then, what an enormous quantity of saliva is necessary to the proper functioning of the digestion.

Of what use is the saliva ? 1st, It facilitates the thorough trituration of the food ; 2ndly, it serves to dissolve the starchy matters, which it transmutes into dextrin, and thence into glucose ; 3rdly, it converts the fatty matters into an emulsion.

The cereal grains contain the following percentage of starch and fatty matters :

Albuminoids—9.80	—Maize.....	64 o/o	Starch...	6.62	Fat and oil	71
"	—10.60—Barley.....	60 o/o	"	2.00	"	62
"	—11.25—Oats.....	62 o/o	"	6.00	"	68
"	—14.40—Wheat..	63 o/o	"	2.00	"	65
"	— 8.80—Rye.....	65 o/o	"	2.00	"	67
"	—11.90—Bran.....	61 o/o	"	5.50	"	67

Suppose, now, we take the case of an animal, a horse or a hog, that does not masticate its food sufficiently. A great deal of the starch and fatty matters pass into the stomach without having been transformed by the saliva; when arrived in the stomach they do not find the necessary solvent, and, consequently do not undergo there any transformation; from the stomach they pass into the intestines, which do indeed secrete an alkaline fluid, but not in sufficient quantity to cause the needful transmutation of the food, if it has not been sufficiently masticated. And this unprepared part of the food either accumulates, as in a ware-house (*en dépôt*), in the great intestine, or is expelled in an undigested state and wasted.

In the case of the ox, there is this difference, its food does not require so much mastication while the animal is eating. Observe this: *while the animal is eating.*

The process as regards the ox is conducted in this way:

The ox has four stomachs, three of which are preparatory.

The food is taken, masticated a little, and then swallowed in great lumps, which fall into the paunch or *rumen.*

The paunch is never empty, containing invariably about a hundred pounds of food.

The meal finished, the beast lies down, and ruminates, i, e, gnaws. thus the food is regurgitated into the mouth from the paunch, in balls of about 3 to 4 ounces in weight and is there remasticated perfectly, and once more swallowed.

One part of each ball (cud), after having been swallowed the second time, goes at once into the fourth stomach, where it is ready to be digested; the other part falls into the second, thence goes at once into the third stomach, where the conversion of the starch and sugar is completed, and at last into the fourth stomach.

The three first stomachs contain alkaline fluids, that is fluids of like constituents with the saliva, and playing the same part in the process if digestion that it does.

Rumination.—Rumination never goes on unless the animal be at rest, and in good health. It ceases in moments of excitement, and at the slightest sign of sickness it is arrested.

How to compel the animal to masticate.—Greedy cattle never chew their food enough. In the horse, this defect can be remedied by mixing his oats with bran; in the ox, by mixing his grain with chopped hay and straw, or by giving the coarse fodder first and the grain afterwards.

Digestion in the stomach.—We must remember that the horse has only one stomach and that a small one, only holding about 4 or 4½ gallons. Besides, it only acts as an organ of digestion to half of its extent, the left sac exercising no influence on the food.

What happens in the horse's stomach when the animal eats his usual meal : 8 lbs, of hay and 10 lbs of oats ?

This is what happens :

The 8 lbs of hay diluted with 32 lbs. of saliva form a mass capable of filling the stomach three times ; for in order to fulfil properly the function of digestion, it only retains ¾ of what it can hold.

By the time the horse has done eating his food, the stomach has emptied itself twice, retaining only the third and last portion of the food.

The meal only lasts, at most, two hours ; the first two *batches* remain only 40 minutes in the stomach.

The rapidity with which the greater part of the mass of food represented by a ration of 8 lbs. of hay passes into the stomach may not be an inconvenience, provided the *mastication* and *insalivation* have been sufficient. For hay only contains 7 °/o of matters upon which the gastric juices exercise their influence, the albuminoids, to wit, as legumin, casein, albumen, &c.

The other constituents : starch, gum, sugar, the analogous matters on which the saliva has already worked a transformation, must finish their conversion in the intestines. And same with the fatty matters.

Thus, if the first part of the work—mastication and insalivation—has been properly done, the short stay of the food in the stomach will be sufficient to allow of the dissolution of the albuminoids the food contains by the action of the gastric juices.

But, if the hay, from any cause, be imperfectly triturated, or insufficiently insalivated, the action of the gastric juices will be insufficient, and the matters intended to support the body will quit the stomach without having been properly converted.

The action, then, of the gastric fluid is chiefly exerted on the albuminoids. Now, the more albuminoids any food material contains, the longer ought it to remain in the stomach. *Oats*, which contain much more than hay, would pass out undigested, did they not remain longer in the stomach than hay. But as oats are five times less bulky than hay, they remain there five times longer.

The ingestion of the feed of oats must not be followed too rapidly by the ingestion of the ration of hay, lest the latter should thrust the former into the intestines before its digestion be perfected.

Practical deductions.—From what I have just said, the following practical results may be deduced :

1. For the horse :

A. Give the hay before the oats.

B. Do not give any more hay too soon after the oats.

C. Do not let the horse drink after having eaten the feed of oats.

D. Let him drink after he has had his hay, in order to remove from the stomach any obstructive matters and disperse them into the intestines where the digestion is finished.

For cattle :

A. The first mastication need not be so complete, since during rumination the food will be chewed again ; and besides, the fluids of the paunch are alkaline.

B. But, if from any cause, the chewing of the cud is suspended, digestion cannot go on, since the food, having only been once masticated, is not sufficiently prepared.

C. Therefore, since rumination is at a stand still, suspend all bulky foods, substituting in its place, mashes, and food in a liquid form generally.

Cooked foods and raw.—Does not this teach us something in connection with feeding pigs ?

How should a fatting pig be fed ? On raw or cooked food ?

You shall give your own answer to the question.

If the pig's food is cooked, I speak of grain, corn, barley, &c.

1. The pig does not eat so much. This is not convenient ; for it is desirable that the animal should eat as much as possible in a given time.

2. He eats faster, consequently mastication is imperfect.

3. In consequence, the food enters the stomach insufficiently prepared. The albuminoids are not properly converted, and, of course, only partly absorbed ; result, waste.

On the contrary, if dry grain be given :

1. The grain is eaten more slowly, better masticated.
2. The pig eats more.
3. The food is in a better state of preparation when it enters the stomach.
4. The albuminoids are thoroughly converted.
5. Entire absorption takes place.
6. No waste of food.
7. Pig fattens faster.

Professor Henry carried out 27 experiments at the experimental farm of the state of Wisconsin. Twenty-six of these go to prove the truth of what I have just stated : that pigs fatten faster, and with less cost, on raw than on cooked food. Only one experiment turned out differently.

I think it my duty to relate you another series of experiments, made under the same professor, for the purpose of discovering if it were possible to make lean or fat pork at will, and which of the two was the more profitable to the feeder.

EXPERIMENTS BY PROF. HENRY, AT THE WISCONSIN EXPERIMENTAL FARM.

He took 6 pigs, of the same litter, and fed them on the same food up to the age of 100 days.

Ration.—Skim-milk, butter-milk, corn-meal and shorts given in the same trough.

At the age of 100 days, they were divided into two lots of three each.

Lot A received 1 part of dried and pressed blood.
6 " " shorts,
14 " " skim-milk.

Lot B received all the corn it would eat.

Each lot was treated exactly alike, The experiment lasted 136 days.

Total amount of food consumed by both lots :

Lot A.—3302 lbs. of skim-milk = 8 lbs. day, each.
1415 " shorts, = 3½ " " "
236 " blood, = 10 oz. " "
Lot B.—1690 lbs. of maize = 4 lbs. 3 ounce. a day, each.

The digestible matters contained in the food of these pigs was :

	Albuminoids.	Carbo-Hydrates
Lot A.—	428 lbs.	823 lbs.
Lot B.—	153 "	1193 "

The total amount of nutriment is within 100 lbs. of being equal in the food of both lots, that is lot A 1251 lbs ; lot B. 1346 lbs.

The albuminoids form the muscular part or lean meat.

The carbo-hydrates, starch, sugar, fat, &c.—serve to support the animal heat and to make fat.

We see then, that lot A was fed for the production of lean ;
lot B " " " of fat.

At the end of 136 days, the pigs were killed, and the blood carefully preserved.

Three sections were made, 1 at the neck, 2 between the 5th and 6th ribs, 3 across the flank. The sections of the pigs were photographed, and the annexed engravings, show the results of the experiment ; and very striking they are.

This is the difference between the two lots :

The live weight of lot A is 19 o/o greater than that of lot B.
The dead " " " A " 21 o/o " " " " B.
The kidneys,spleen and liver of A are from 32 to 42 o/o greater than those of lot B.
The blood of A " 59 o/o greater than that of B.
The bristles and skin of A " 36 o/o " " " B.
The large back-muscles of A " 64 o/o " " " B.

Of all the meat that could be cut from the carcases of lot A, 38 o/o was fat, of lot B, 46 o/o.

The bones of A were 23 o/o heavier than B's, and the thigh bones of A were 62 o/o stronger (by the testing machine) than B's bones.

Practical conclusions.—It will be seen from these quotations that in animals fed on too fattening food, i. e. on food too rich in carbo-hydrates, the bones, the muscles, and the internal organs, diminish in volume, the blood, especially, diminishing by one-half.

Consequently, their constitutions are considerably weakened. If attacked by sickness, they have no power of resistance. Should a contagious disease affect them, they immediately fall victims to it. Their legs fail them. Rheumatism worries them, and, lastly, their fattened carcases are less valuable since, they weigh less.

And these further considerations must be borne in mind :

The breeding sows must receive food fit to sustain the skeleton, the bones and the muscles, as well as to harden the constitution, such as skim milk, butter-milk, bran, pease, and green clover, with a small proportion of maize, &c. The piglings, too, require food pretty rich in albuminoids. When they are weaned, the following will be found suitable : 2 parts of milk, 1 of pollard, 1 of maize. If they are pastured on clover, their frame will show increased growth,

When the fattening time comes, pigs may be forced on maize, if fat pork is wanted, and on albuminous food, as bran, pease, and flesh, if lean is preferred.

Hence we find, that *boars* should not have food too rich in carbo-hydrates, since with such food their frames would be less strong, their constitution, weaker, and their progeny delicate.

Milk, a few pease, bran, and flesh, are the best things to feed *boars* on.

As to the horse.—Another result from what precedes is that the best of all foods for the horse is a mixture of bran and oats, which of all the cereals, except wheat, contain the greatest amount of albuminoids, and sufficient carbohydrates to be economical.

Now, as the food of the horse must be regarded as furnishing, not fattening supplies, but muscular force, stoutness, energy and the durability of the muscles, that food that contains the greatest proportion of albuminoids—oats and bran—must be given to him.

But wheat, you will say, since it is richer in albuminoids than oats will be fitter horse-food that oats. Not at all. For besides the constituents of the other cereal grains, oats contain the *black principle* (*principe noir*), which is the stimulant par excellence of the horse. Nothing, then, not even wheat, can be substituted for oats for horses.

Cooking destroys the black principle.—This principle is destroyed by cooking. Consequently, oats must never be either boiled or scalded.

Thus, the greater the speed required of your horses—on the race-course or on the road,—the heavier the labour, the greater the quantity and the finer the quality of the oats must be.

If you want to fatten a horse quickly, give him thickish mashes of corn or barley-meal, and linseed-cake.

Fattening cattle.—How many people know how to fatten cattle? Or, rather, how many do not know how? By far the greater number of those who turn their attention to this branch of agriculture.

To make fattening beasts profitable, it must be done as fast as possible; and this is true of the fattening of all kinds of stock?

Take the case of two men who, the same day, put up to fatten a bullock a piece, the two beasts being each of the same age and build, and in the same condition as his fellow.

A. gives his beast only hay: 3 bundles a day = 18 cts.—18 cts.

B. gives
- 1 bundle of hay - - - = 6 cts.
- 3 lbs. of bran - - - = 3 cts.
- 4 lbs. of oats - - - - = 4 cts.
- 3½ lbs. of cake - - - = 5 cts.—18 cts.

As the hay only contains :

7 o/o of albuminoïds, and 30 o/o of carbo-hydrates=37 o/o of nutriment. And the bran contains :

	Albuminoïds,	carbo-hydrates	
	11.90 o/o	67 o/o	=78.90 o/o of nutriment
" " Oats	12.25 o/o	62 o/o	=73.25 o/o of do
" " Cake	8.00 o/o	77 o/o	=85.00 o/o of do

It follows that the beast who only received hay has been fed on food that only contains 37 o/o of matters serving to form fat and to support the animal heat, while the other has received rations that, in a smaller bulk, contains from 37 o/o to 85 o/o of nutritious matter. And both rations cost the same sum. That is, if A's bullock takes 5 months to attain to a specified degree of ripeness, B's beast will reach the same point in three months.

Which of these two methods will pay the better ?

This brings me to another point : the choice of beasts for fattening.

Some beasts fatten well ; others fatten very badly.

Can one judge, by inspection, beforehand, which beasts will pay for fattening, and which will not ? Decidedly.

He will choose, in the first place, those that are nearest to the ages of two or three years ; the older they are, all things being equal, the more difficult are they to fatten.

He will not pick out beasts that are too poor, for they would have to be kept fattening too long, and there would be too great a loss of " the food of support. "

He will select those with fine limbs and with fine heads and tails ; with well rounded ribs, that is, with the barrel springing well from the back-bone, and round ; with the withers (*plates we call them—Trans.*) back-loins, and rump, wide ; the twist too, ought to be well let down, or, in the vulgar tongue, it ought not *to be cloven too high* (fendu trop haut). The body should be as large and the legs as short as possible. The skin must never be too dry, nor stick too tightly to the ribs. Lastly, choose in preference those beasts that share in the blood of the Shorthorns, of the Herefords, or of the Angus.

An especial mark of an unkindly fattening bullock is that he has a depression behind the shoulders which seem as if they were girthed in (*sanglées*) ; such, never mind what breed they belong to, are bad feeders, and bad beef-makers.

Fatten badly, too, do all beasts with long legs, with small bodies, with flat sides; and those that have coarse heads, legs, and tails; as well as beasts that are narrow over the plates, the back, the loin, and the rump; so too do all old beasts.

If the feeder will be guided by these simple rules, in making his purchases he will find that they are not without their value.

J. A. COUTURE,

N. B.—The annexed engravings show the appearance of the pork mentioned by Dr. Couture, after being cut up. Lot A (figs. 1, 2, 3) was fed to produce *fat* meat, and lot B. (2, 4, 6) to produce *lean* meat.

FIRST SECTION OF THE PIGS.—*Near the Head.*

FIG. 1.—Lot A.
Fed for FAT.

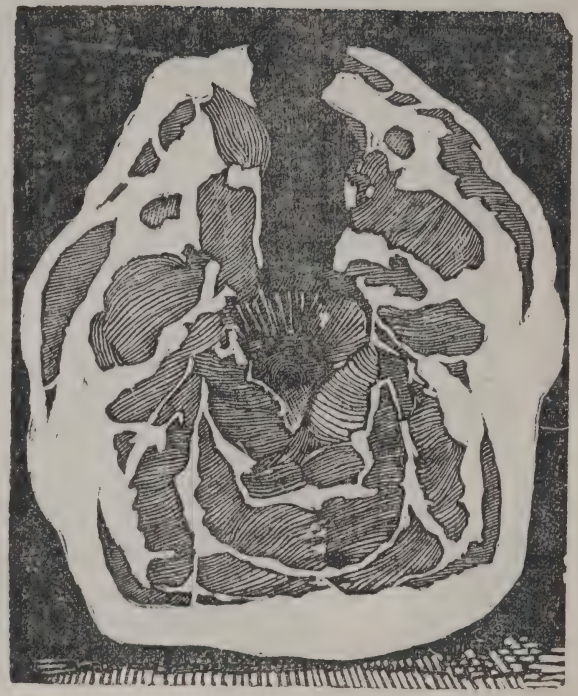

FIG. 2.—Lot B.
Fed for LEAN.

SECOND SECTION OF THE PIGS.—*Between the 5th and 6th ribs.*

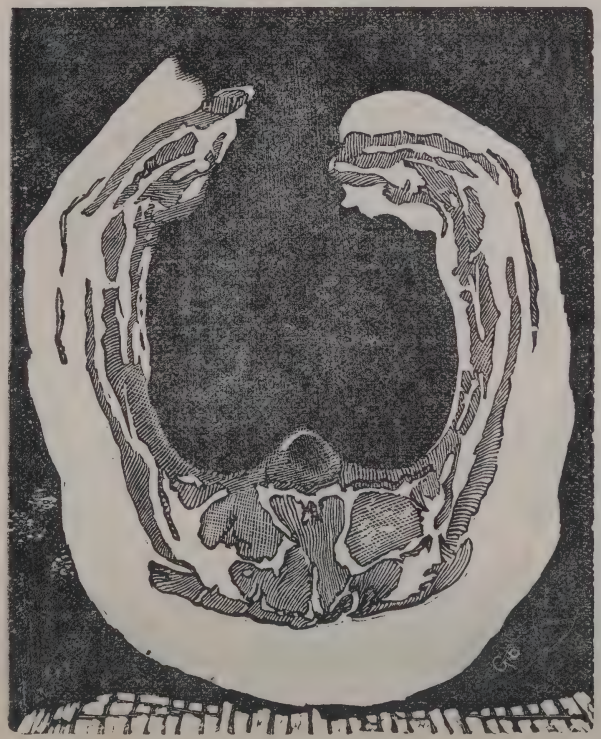

FIG. 3.—Lot A.
Fed for FAT.

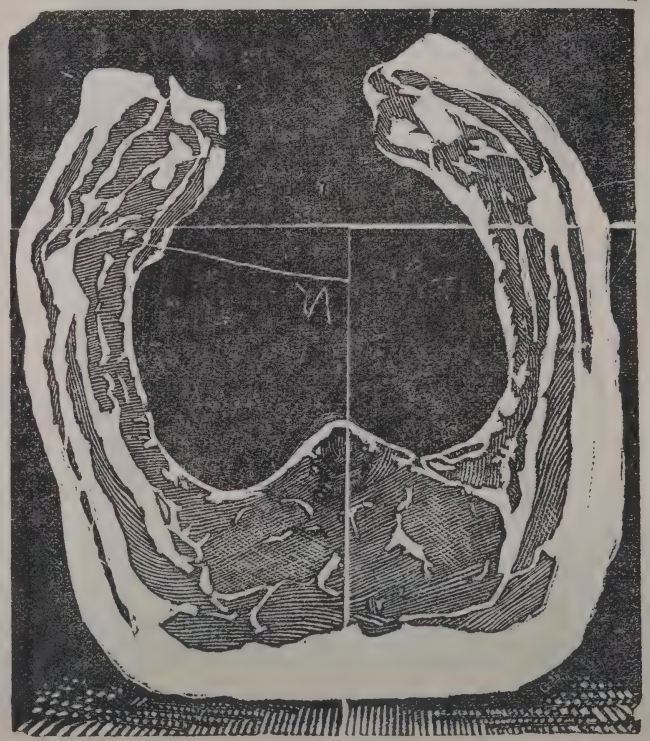

FIG. 4.—Lot B.
Fed for LEAN.

THIRD SECTION OF THE PIGS.—*Through the Loin.*

Fig. 5.—Lot A.
Fed for FAT.

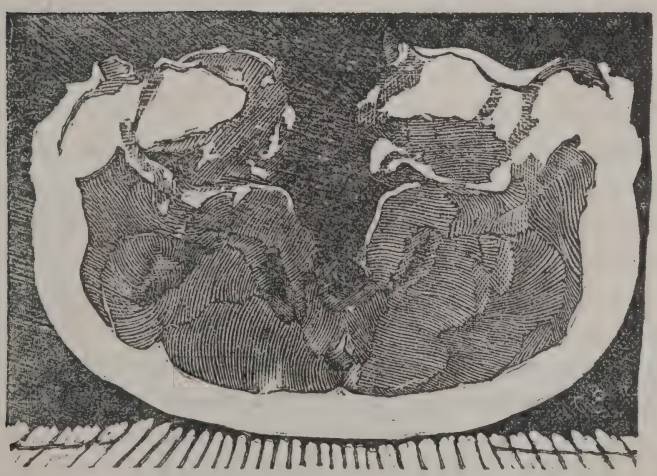

Fig. 6.—Lot B.
Fed for LEAN.

THE TOUR OF THE AGRICULTURAL COMMISSION.

Address of Mr. Bernatchez, M. P. P.

Mr. President and Gentlemen,

I confess that I feel rather embarrassed, and I can assure you frankly that, at first sight, I do not quite see how I am to extricate myself. Well I reckon upon your indulgence to win my pardon for all that may be worthy of blame in my views, as well as in my way of expressing them.

I will not pretend that I have not had time to prepare myself; but circumstances have prevented any preparation ; for I have been so busy for the last few days about very important matters, that I have not, been able to gather my ideas together sufficiently to express them in a proper and fitting manner. Still, counting on your kindness, I will yield to your wishes, I accept your invitation.

M. l'abbe Provencher, at the begining of his lecture, said that when one had eaten an inferior soup, sometimes the flavour of a good piece of roast beef,served up afterwards,put the taste of the soup out of one's mouth but I cannot create the good joint of meat ; so I calculate on the dessert to make you forget the meat. I find M. Provencher's soup capital ; only, at the bottom of the plateful, I thought it a little too highly peppered.

I must, first of all, congratulate you, gentlemen, on the idea of establishing this Dairymen's Association : the merit belongs to the President, ands probably, for the greater part, to the gentlemen of St. Hyacinthe. No one can tell the amount of good that this association has done,since its foundation, to the Province of Quebec.

It was, I believe, in the second year of its existence that I became a member of the association. Before that time, occupied as I was with ship- and shipping, I did not trouble myself about agriculture or cheese-factories ; I had not paid attention to the movement then going on ; but the first time I was present at one of the meetings, I felt how important this association was, and since I became a member, with the exception of last year, I have not missed a single meeting. My health did not permit me to be present on that occasion. And this year, when I received an invitation not only to be present at the meeting but also to address it, I accepted, though not because I felt able to discharge the duty imposed upon me ; but I did accept the invitation, and I came here with a view to learn something, which I certainly have not failed to do, thanks to the lecturers whose addresses I have listened to.

I said that we ought greatly to congratulate the Dairymen's Association. As Mr. Provencher said with so much truth, the business of the dairy is the business best calculated to advance the cause of our agriculture.

We have, before now, listened to many lectures. Learned lecturers have for a long time gone through the country ; but all things grow stale : a new organization was needed, and the dairy business has been brought to the front to inaugurate for us a new era of prosperity.

As some one observed just now, if we want milk, we must feed our cattle well ; to feed them well forage is necessary, and the dairy-business is the one best fitted to encourage the farming class, by affording it the means of improving its cultivation.

With us, below Quebec, it is hardly 7 years since the first factory was established, and now they exist in numbers, and are multiplying themselves every day.

There are, too, many creameries there. And I believe that is the best part of the province for the production of a butter, on account of the climate. The pastures are excellent, and the climate being cooler than the climate of Montreal, it is easier to keep the milk in good condition.

This industry deserves, then, all possible encouragement. Last year, in the House, I did not fail to assist the association's object ; I used all my influence in its favour, and as long as I shall coutinue to be a member of the House, I shall not be backward in doing all in my power to develop the dairy business to the utmost possible extent.

As it was remarked just now, in order to preserve our market, we must make a good article. To have a good article, we must have good makers, and to have good makers, we must have them well taught. We must, then, establish schools.

And, while I am on this subject,allow me to congratulate Mr Archambault, of St-Hyacinthe, a professor, now, for a number of years ; the numerous cheese-makers who have learned their business in his factory have given general satisfaction. And, in passing let me say that, last year, I had the pleasure and the advantage of sending my son, who was already a cheese-maker, to take lessons of Mr. Archambault in the new system of making Cheddar cheese. He has greatly profited by these lessons, and has perfectly succeeded. This year, in the factory in which my son is engaged nearly a hundred thousand pounds of cheese have been made, and I am bound to say that there was not one bad cheese in the lot. And this is

clearly due to the teaching my son had from a competent master. Without a master, he would have done like many others. It would have taken him a much longer time to learn how to make a good article.

I believe it to be the duty of the province to increase the number of these dairy schools ; they are not numerous enough. When the school is far off, it is an expensive business to visit it, and one does not like run to the risk. It is perfectly true that the association has greatly aided the improvment of the manufacture of cheese ; but there are still blots to fill up, and it is through the establishment of more schools that the deficit will be supplied.

Mr. Archambault has imparted an idea to me which, coming from a man like him, is worth while mentioning. It is this : every week there should be published, either in a special journal or in one of our agricultural journals, a programme showing how milk should be treated in such and such a condition ; at such and such a temperature, at such and such a season of the year. For my part, I have no great practical knowledge of the manufacture of cheese, only I hear the matter constantly talked about, and I think Mr. Archambault's idea is a very good one.

Every cheese-maker should take in this special journal, and so should the proprietor himself, and the latter should watch the maker at his work, to see if he is carrying out his instructions. This journal should be directed by professors like Mr. Archambault, or by other competent persons.

It was, then, with pleasure that I yielded to the request of Mr. Archambault, to relate to you the idea which he communicated to me. If we have more schools, there will be many reforms to be inaugurated by means of them.

To these meetings come every year numbers of persons from all parts of the province : they resemble so many teachers who,on their return home, will disseminate in their districts the ideas they have heard uttered and discussed here. The more widely developed our knowledge of these things becomes, the more shall we be able to produce a good article, and the better will the market prices become.

As some one said at the afternoon session, we have an excellent market in Europe. Well ! Let us do our best, not only to keep it, but to improve it.

The people of the United States are now our inferior in the cheese-market. They lost it because they aimed at making too much profit ; they made butter and cheese on the combined system, and they succeeded

in lowering the reputation of their goods. To-day they are trying to regain their reputation. Well! we are at the head of the market, and we must try to keep there. Besides, though I am not very well acquainted with the States, I am led to think that our position is better suited to the production of a good article than theirs. Our pastures are excellent, and the climate is favorable.

Our worthy secretary, Mr. Taché, has requested me to give an account of my tour in my capacity as president of the commission of agriculture, I will do so, but briefly. I took no notes on my tour, and, besides, we went at rather a racing pace.

Although Mr. Provencher does not approve of agricultural commissions, this one was chiefly formed with a view to the investigation of matters concerning the agricultural colleges ; but, as we were on our road, we thought it right to turn aside when we found ourselves near any celebrated farm.

We had not sufficient time to bring our work to perfection ; there were a good many of us, and we passed rapidly through most parts of the country, reserving our time for the study of the schools of agriculture.

Still, that did not hinder us from perceiving, that in many places, a great improvement in the system of farming has taken place.

I am not skilled in the theory of farming, but I am a practical farmer, and of considerable experience, having cultivated land up to the age of 37. In company,then, with my colleagues, I was able during my journey, to grasp those points connected with agriculture which were the best worth giving an account of.

Our investigation began with the school at Ste Anne de la Pocatière. A superb farm it is, of, I believe, 330 arpents ; the soil in almost every part of the best quality. The buildings are very good ; particularly a nearly new barn, the arrangement of which is full of taste, and it is conveniently divided for the stock and crop. It is not quite perfect yet, but, with a little improvement, it might be made, according to my ideas, an establishment of the best class. There are roomy buildings, where larger crops of hay can be stored and a silo which is filled with ensilage made of vetches or tares sown on the stubble the year before the hay.

I fancy the course pursued here is one of 3 years ; 1st. oats, 2nd wheat ; 3rd. vetches: which crop is harvested so late, that the director, Mr Tremblay, told me that he had ensiled vetches after the snow had come, and that the silage made from them was excellent.

Here, at St. Hyacinthe, you have the advantage of being able to grow maize. In that part of the province where St. Anne is situated, maize may succeed perfectly ; but the season is shorter than it is here, and they prefer vetches, which make good silage.

Thus, if from one point of view, this farm leaves something to be desired, there is a good deal of practical good to be found there.

Thence, we went to St. Roch des Aulnaies, where we visited the nursery of Mr. Dupuis.

I do not think, gentlemen, that we pay sufficient attention to the cultivation of fruit.

Mr. Dupuis, whose farm is situated below Quebec, succeeds very well indeed. His trees are accustomed to the climate. Besides, fruit trees can be grown with advantage in every part of the province. From what we saw in Ontario, whence we import most of our fruit, especially apples, we may be successful in this pursuit ; not so successful as they are but successful enough to supply our own markets. Fruit-growing is less costly than grain-growing, and we have soils well suited to it. All that is wanting is that the work should be begun.

From Mr.Dupuis' place, we went to Montmagny,and there we found the farming pretty much what it was in other parts. In every part of Quebec there are instances of capital farming, as there are of very bad farming. Models of what farming ought to be exist in every district, and they ought to be appreciated. Addresses, such as we hear at these meetings must cause the appreciation to be more general, but I do not think that is sufficient for the purposes we have in view.

At Richmond we visited the farm school. Quite on a different soil to that at Ste. Anne's. The land is not good, and the school is newly established. Truth to tell, no great results have been derived from this school. It has passed into the hands of men of means ; improvements are planning: perhaps. these will be carried out, and the school will thenceforward give greater satisfaction. We found a creamery there ; in very good shape ; but only cream is taken, as the farmers prefer only carrying cream to this butter factory. No great quantity of butter is made on account of the town being so near ; a great quantity of milk and cream is used in a town like Richmond.

The pastures, besides, are not very extensive, so no great number of milch-cows is kept.

From Richmond, we went to Guelph, in Ontario, to see the justly celebrated experimental farm in that neighbourhood.

The farm is splendid ; 500 acres in extent, of which 50 acres in wood and the rest, 450, in cultivation.

The whole establishment is on a grand scale. Experiments are carried on. When the farm was first started, the farmers of the district, it seems, did not interest themselves much about it. It was freely criticised, as everything newly put forward is criticised. It was said to be a political manœuvre. But, at present, things are in a very different position ; at least so I was told by Professor Mills. The farmers believe in it to the greatest extent, and they come from all quarters to inquire into the experiments that are being carried on. These are made at the expense of the province, and the farmers benefit by them.

And, in truth, experiments are made on every subject. On this point, I will repeat to you what Professor Brown said to me about a Canadian cow. They have a pasture at Guelph where all sorts of milch-cows are kept : Jerseys, Canadians, Holsteins, Ayrshires ; cows, in fact of almost every breed. And these cows are all under the same management, the same care, and the same food ; they are milked separately and experiments are made on the richness and the quantity of milk that each cow gives. Professor Brown said, as he was showing me one of them : " Look at that Canadian I bought two years ago, on the market ; here's another, a Guernsey that cost us $300 ; well as regards profit from their milk, the Canadian is worth $100 more than the other." So, you see the Canadian cow is not despised in the province of Ontario, even at the Guelph college.

I must say that wherever we went we were well received ; and, in Ontario the English welcomed us heartily ; they were sympathetic and obliging, and gave us every possible information that we could require, beside placing themselves at our disposal when we wanted any assistance.

We saw at Guelph many superb animals. There is a magnificently arranged creamery, kept in the most perfect state of cleanliness. Butter is made here for exportation to Europe. The creamery is closed in the middle of October. Everything about it is in perfect order.

As for the arrangement of the buildings, it is needless to say that it has been done in the best possible style, and with a good deal of taste.

Expense is not considered. A barn, built last year, cost $22,000 ! At such a price it is not difficult to secure conveniences. It is very large ; there are a great many head of cattle in it ; and it is in perfect order.

From Guelph, we returned home; and recommenced our investigations as we passed through St. Hyacinthe. There we were received with much kindness by Mr. l'abbé Chartier, who gave us a great deal of practical information which I was happy to hear him repeat to-night.

At the Seminary farm we saw superb cattle, splendid garden crops ; a piece of land in tobacco such as is rarely met with ; bees, vegetables, and maize. Now, for the silo. This silo question is not to be despised It is two years since I first heard, at St. Hyacinthe, the question of ensiled crops treated by Mr Beaubien. Now, you meet many farmers who possess a silo, and succeed to perfection in making silage. No better instance of the good these lectures do can be found. Before the expiration of five years, there will, perhaps, be a hundred times as many silos as there are at present. Then we shall have the advantage of feeding a much greater number of cattle, with much less trouble, and to much better profit.

In many places, the spontaneous fermentation or the scalding of fodder is already being practised, and this plan ought to be more extensively followed. People often say to me, however : " We cannot afford to put up boilers to enable us to scald our fodder or to set it fermenting." Well ! gentlemen, that is a mistaken notion, I will convince you that it is so by an example.

For the last 7 or 8 years, in the parish of Beaumont, between that place and St. Michel, has resided Mr. Bélanger, a farmer and dealer, whom most of you know. He cut his fodder into chaff and scalds it ; this saves one-half of it. Mr. Bélanger said to me last year : " My system is not imitated, but, for all that, I shall keep on with it." In March, I went to see him, with my brother, and we found 44 fatting beasts, all of whom were being fed in this manner ; and in the course of that year he turned out three lots of fat beasts. There is a well behind the barn, under a shed made for the purpose, and a boiler like those used by tanners. I cannot explain exactly how the scalding of the fodder is done, but there is an iron pipe enclosed in a wooden box, and the water is heated by the fire of a furnace. There are four taps in front of the boiler. Several pails are used, each holding about a bushel, which are filled with chopped and scalded fodder every morning. The cattle drink the water that has scalded the stuff. There is no rack, or manger ; the beasts are two in a stall ; and not a particle of straw is to be seen in the dung. A passage runs in front of the cattle, and the pails are piled one upon another, so that the bottom of the upper one sinks a little way into the top of the one below it. The only one that has a cover is the uppermost.

Mr. Belanger works his chaff-cutter by means of a power, on which he puts his horses, and sometimes, even his fatting cattle. He estimates the saving at $\frac{1}{3}$ of the fodder, at least. His farm yields much more than when he began this way of feeding, and his cattle are always in good health.

His cows are treated in the same way; the horses have their hay chopped, but not scalded.

And to show you how well this answers, and that the system can be pursued by everybody, I had at that time two milch-cows and a horse. Hay was then selling at $12 a hundred bundles at our place. According to my calculation, I had to buy from 100 to 150 bundles for my stock. I said to myself: I will buy a chaff-cutter, and thus do without buying the hay. I bought one. There was some two--year-old straw in a corner of the barn; I had some barley and some hay cavings (balle); I mixed a little hay and some bran with the chaff, and succeeded in wintering my cattle without buying any hay. Consequently, I paid for my chaff-cutter in that space of time; and my cows began to improve in condition and to give a good deal more milk. I had small Canadian cow, which weighed about 400 lbs. She calved; I fed the calf—or rather, it sucked its dam—for seven weeks; the calf did not take all the milk the cow gave at night. At the end of the time, I sold the calf to the butcher for $11.00! Do you think that with ordinary feeding I should have been able to feed a calf as long and as well?

All the preparation I made was to arrange a sugar-kettle, that lay in my cellar, for the purpose; that was absolutely all. There are many farmers who only keep 5 or 6 cows, and they, with a similar kettle might easily scald their fodder.

With a little boiler like that which tanners use, all the hay, straw, and cavings can be scalded. Then, your cattle will be in good order, and the cows will milk well throughout the season of summer.

I give you these details in answer to those who say that the plan of scalding food is not within the reach of every one. All that is needful is to set about the business heartily.

We visited other farms at St. Hyacinthe: that of Mr Archambault, of Mr Bernier, and of Mr Péloquin. All who see it are delighted with this, the centre of the agricultural district of the county. Here are some of the finest and best managed farms that we observed in our tour.

From St Hyacinthe we went to Oka, to the farm of the Rev. Trap-

pist Fathers, whom I am happy to meet here. We saw the marvellous amount of work that has been done on this farm during, I believe, the last 5 or 6 years. These reverend fathers occupy a spot that is not a very favourable one ; rather stony, and the wood that covers the land is not composed of timber-trees but of second growth, which makes the labour of clearing it very troublesome.

They have 54 cows, and all the hay necessary for the cattle is grown on the farm.

They have five or six fine horses, and all the stock is fed on the produce of this second-growth bush-land. which has only been cleared about 5 or 6 years. The soil is not bad, but in certain spots, not of first-rate quality. The crops are pretty extensive.

Here, we saw a large garden surrounded by a boulder-wall, made, we were told, with mortar. The proprietors are monks, but they know how to work, I can tell you ; or, at least, they know how to make others work. We saw what kind of life the fathers lead in the monastery : these reverend men deserve much credit. I believe that if they receive some assistance from the government, the province will not be the loser ; for they set an example that must bear fruit.

Thence, we went to l'Assomption, where we were received in the most agreeable manner. Mr. Marsan, the distinguished professor of that school, is about to honour us with a lecture, which will, no doubt, be of great use to us.

At this farm, we found a superb herd of 26 Ayrshire cows. The land is not of the best quality, but Mr. Marsan gets good crops from it. Mr. l'abbé Provancher told us that our agricultural schools have not given entire satisfaction ; but that is because they do not receive what is necessary for agricultural instruction. Mr. Marsan has not at his disposal what he requires to afford to the pupils the amount of agricultural teaching which he wishes them to have.

Let us hope that time will bring about a change in this state of things, and that our agricultural schools will rise to the dignity of their position. People desire that the teaching of agriculture should become general ; well ! for that there must be teachers, and they must be placed in a position to give the desired instruction.

I will permit myself one little observation ; Our farm-schools do not receive sufficient encouragement. At Guelph, four years ago, there were 82

students, and strange to say, there were as many students from Quebec in this Ontario college, as there were in our three schools together. We will hope that this state of things will, in time, disappear.

Another observation: why do our lads dislike farming so much? It is, I believe, because we do not appreciate properly the dignity of the farmers' position. I have met people who amuse themselves by ridiculing farmers; they seem to think that the farmer is inferior to other men. Well! gentlemen, in such circumstances I have always taken up the cudgels in defence of the farmer and I beg all my countrymen to do the same.

I have never been ashamed of my position. When I was especially engaged in farming, I was like the rest; I did not wear broadcloth; I wore the country cloth, in which I was more at ease than I am at present, and I thought I was as well dressed as any of my neighbours. So let us endeavour to raise the position of the farmer, by placing him in the situation he ought to occupy.

In this way, I believe that we shall succeed in making our young folk understand that they ought not to think farmers less worthy of respect than other men.

Now, gentlemen, we come to the farm of Mr Barnard, the director of the Journal of Agriculture. We went over the whole of his farm, which is situated at Three Rivers. Our reception was most cordial, and Mr Barnard put himself at our service with much kindness. Unfortunately his farm is not of a nature to repay the zeal and talent that have been expended on it.

The cattle are numerous; they are known to everybody; but we felt convinced that Mr Barnard's farm was not on a level with his agricultural attainments. The soil is ungrateful.

Continuing our tour, we came to the farm of Mr Ritchie, at Ste. Anne de la Pérade, and this was the last visit we made. It is a splendid farm.

The cultivation is not yet in a very improved condition, but, as the proprietor told us, he has only been there three years or less. But what struck us more than anything was, that above everything else, he is a breeder of stock. He has pure-bred and half-bred Canadians, Jerseys, Ayrshires, and Holsteins; a creamery is on the premises, in which he employs the milk of his herd.

Moreover, the buildings pleased me more than any I saw on my tour. They are even more convenient than those at Guelph, though not on so large a scale.

I was told that Mr. Ritchie had spent a great deal of money on these buildings. But, if one would rest satisfied with a range of buildings, which, without being so complete as these, are not far from being so, one need not be quite so lavish. I believe that any one who builds an entirely new set of barns etc., may build them on as handy a plan as Mr. Ritchie's with as small an outlay as the cost of an ordinary set. Mr. Ritchie had to rebuild an old barn after the present plan ; and that is always an expensive job.

I will try to give you an idea of this building.

The cattle are tied head to head, and through the middle of the building runs a passage wide enough for a cart to pass. Under this passage is the root cellar ; there are three trap-doors in the floor of the passage, at equal distances ; a cartload is brought in, the roots are upset into the trap and the cart is emptied in a moment. At the other end of the passage is another door which allows the tumbril to pass out, without being obliged to return by the road it came in by.

The cattle, as I said, are tied head to head ; the cows have separate stalls ; they have only a halter to fasten them, and are quite comfortable.

At the end of the floor of each stall there is a 3 inch board, 11 inches wide, sunk three inches below the floor, and the rest of the passage is on the same level as the floor. This forms a small channel. That part of the passage which is level with the floor is always dry. There is a transverse passage for the dung by which it is carried to the dungshed. The horses are lodged in the same way.

In the passage are boxes where the chaffed hay and straw are put. The chaff-cutting is done in the upper story. It is all steamed, both for cows and horses, by means of a boiler which is placed in a building in front of the barn. This exacts a certain expenditure, but, to those, who like Mr. Ritchie, have a large farm, the outlay is advantageous. The water for the cattle is always warmed.

There is also in the upper story a passage through its entire length, with a door at each end, and a bridge, so that the loads can be drawn straight along, without being obliged to turn round to get out.

This passage is always empty in winter ; it serves the purpose of a threshing-floor, and the chaff-cutter is worked there. At the side is the threshing-machine which is driven by the steam engine that is attached to the creamery, by means of a connecting chain.

As fast as the straw is shaken, the grain is winnowed, and the straw cut into chaff, by which process it takes up much less room. The grain is stored in the upper flat of a sort of barn that leads out at the end of the principal barn. Everything, then, is done on the same level, which saves a great deal of time.

I give these details for the sake of those who intend to build. There is no doubt, that if one could get a good idea of this barn into one's head, farm-buildings might be erected in a much more commodious fashion than those we usually see.

I forgot to mention the barn at Oka ; I will do so now. That range of buildings is not so costly as M. Ritchie's, but it is very convenient. The roots are in front of the cattle. The building is situated on the slope of a hill ; the dungshed is close to the barn, and so is the creamery ; in fact, the whole arrangement is complete.

I have finished the description of my tour. Before closing, I should like to say a few words on agricultural clubs.

I do not think these clubs are numerous enough. Some people are opposed to them. I admit that in the older parishes they are not necessary, but in the back-parishes, which are not near the large towns, these clubs are of great importance, and wherever they have been established, they produce fruit. They do on a small scale what is done here on a large one. Genuine are the lectures that are given to them. The parish-priest is generally at the head, and he imparts a profitable share of his knowledge to the members. The most noted farmers attend to the meetings, and describe their system of cultivation to the audience. The work, then, is a useful one. I trust that these clubs will multiply, especially in " far removed " parishes.

The cultivation of roots, particularly of mangolds, has been treated here. I can understand that on heavy land, this is not profitable ; but on soils that do not harden too much, roots do well, and their cultivation is one of the means of improving our meadows. Wherever roots are grown the land is always much improved.

In Upper Canada, they have in this respect, more advantages than we ; for, as a general rule, their land is easier to improve. Their soil is certainly not as good as ours ; it is sandy, and when I returned thence I cried : " What a good thing travelling is ! How it makes one love one's home ! " For except in a few districts, we found everywhere, in the province of Quebec, a soil of the finest quality. Only in Quebec the cultivation is carried on in a more or less careful manner.

From Ottawa to Toronto, the land is almost all sandy, and of a *rolling* configuration. If this soil had been as long cleared, and had been as badly cultivated as most of our farms, my belief is that the province of Ontario would be very poor. But the farming is very good, and they grow a great acreage of root-crops.

Other parts of Ontario are very fine. For instance, from Niagara to Hamilton there are splendid level farms, and numerous orchards. Apple, trees, peach, trees, and vines, are grown on a large scale. Apple trees are, planted far apart, and the land is ploughed between them. I was told that there were whole farms in orchards managed like that. If we cannot do this on a large scale, at least we might try to do something of the sort.

From Hamilton to Guelph the land is inferior. At Guelph, the people told me that for the last ten years their trade had decreased, which makes me say, that when once the timber has been got rid of, they have no longer the same advantages as we.

With our good farms, with good cultivation, and with the product of our dairies, we shall soon triple, nay, quadruple our incomes.

I beg you to pardon the long, wearisome address I have made ; if what I have said had been delivered with greater eloquence, it might have proved interesting ; but I have acted from pure good will.

Before closing, I wish to exculpate myself on the subject of agricultural commissions, which have been condemned by M. l'abbé Provencher.

It may be that these commissions do not give entire satisfaction, but they are not appointed, as the abbé seems to think, as a means of enabling us to make money ; they do not pay us I can assure you Besides, I hope that the reforms we shall suggest in our report will please M. Provancher, and that he will be obliged to confess that, for once, an agricultural commission has done a little good.

Once more, I ask for your forgiveness, and thank you for your kind attention, and, as I said at starting, the dessert will now put the taste of the inferior piece of roast meat out of your mouths.

M. l'abbé Provencher.—I had no intention of making a personal attack upon any one, and I explained myself clearly to that effect. I said that, on principle, I was opposed to the Council of Agriculture, to commissions of agriculture, and to other jobs of the same kind which are being uselessly multiplied in the province. For my part, I think that all the information we require can be obtained, without having recourse to costly commissions which run about from one province to another.

I am glad of one thing : that is, that Mr. Bernatchez has been good enough to like the soup, and that he did not discover the pepper till he had nearly arrived at the bottom of his plateful. Then, I am sure, it did not bite his tongue !

ADDRESS OF MR. BEAUCHAMP, M. P. P.

Mr. President and Gentlemen,

I shall address you, in the first place, Mr. President, thanking you for the honour you have conferred upon me in asking me to address this meeting. Still, I cannot refrain from accusing you of severity in taking me thus by surprise. I came here to learn, not to teach. I am still young and in need of instruction. And I am by no means prepared to say anything worthy of being listened to by this meeting. So I mount this platform, Mr. President, only to say that I cannot accept your invitation. There are so many people well prepared, and able to tell us such instructive things, that I would prefer employing my time in listening to them.

Neverthless, I may make a few remarks ; not to bring forward any new ideas ; but simply to show my appreciation of that which I heard yesterday and this morning.

Yesterday, there was mention made of whole-milk and of partially, skimmed, milk cheese. I listened to the discussion with much interest and I asked myself this question : what is the object of those who desire to make partially-skimned milk cheese ? My opinion is that no cheese of this sort ought to be made.

I approve of Mr LeSage's opinion on the subject of the mark to be affixed to the cheese. This mark might give a bad name to the country. It would be better, in the district where skim-cheese is made, to convince the patrons that it ought not to be made And this, I think, would be easily done, by means of lecturers, for instance, travelling about the country during the summer season, when butter, and cheese-making are in full swing. The inspectors, for example, might deliver lectures on the subject.

The cultivation of maize was another subject treated. I had intended when the discussion began, to take part in it ; but I found that enough was said during the conversation that ensued to instruct every one in the different modes of cultivating it.

In passing, I will mention that Mr Brodeur's way of growing maize is that which I chiefly imitate. There is, however, a slight difference between his system and mine, which permits of a trifling saving of time ; I will tell you how I proceed.

I sow Western corn, after having well stirred and pulverized the land; it is unnecessary to say that everyone should do the same; corn should never be sown in hard ground.

I only plough once and sow: but Western corn ought to be sown on high dry land. I plough in ths way: I plough a first *bout*, and for the second I sink the point of the plough less deeply, though still enough to turn over the land, and I make the third bout deeper, the same depth as the first, in fact; and so on. In this way, the furrow drill in which the corn is sown is higher than the furrows on each side of it. I sow broadcast in the furrows, that is, in every other furrow.

In eight, ten, or fifteen days, as soon as growth begins, I pass the harrow over the whole. In this way, the grass does not injure the *braird* of the corn.

I have been very successful in this way, and it takes very little time. The harrowing Mr. Brodeur gives to cover in his corn, I give to assist its growth.

Talking of commissions, Mr. Provancher said he was opposed to the Council of Agriculture and to agricultural commissions, on principle; that a commmissioner of Agriculture, if well qualified for the post, would answer all purposes. I did not at all take that for an attack on the commission which inspected the agricultural schools, neither have I any intention of recriminating on the subject. I only wish to show you under what circumstances that commission was appointed.

I have the honour to be a deputy of the province of Quebec; and last year, at a meeting of the committee of the house on agriculture, it was proposed to increase the grants in favour of the agricultural schools of the province. Being, as I was, one of the immediate representatives of agricultural interests, I could not well vote against the grant. On the other hand, I said to myself: Is this useful, is it needful? Unfortunately, I had not at that time sufficiently studied the duties of my position, and was ignorant of the way in which the functions of the schools in question were operated. So I made up my mind to go and see them. The reports that are received from the schools are, I am sure, made without forgetfulness of the subsequent year. I do not blame those who make these reports the more for that, but I consider it proves that private interests may interfere here with the interests of the public.

So I said to my colleagues: Why not go and visit these schools? Little did I then think that the government of the province would be so

generous as to offer the means of making this trip, free of cost, to all the farmer members of the house : but it did so !

In the committee I said : Come, practical farmers ; come, let us visit these farm schools. Let us see how the herds are kept at the farms, how the buildings are arranged, in what condition are the pastures, the fences, and the ditches : then, we shall have no need to consult the reports.

It was from this idea that the commission sprang into life.

Thus, if any one be to blame in the matter, it is not the government but I, and I take the whole responsibility on myself. My aim throughout was to afford proper agricultural instruction to the farmers of the province of Quebec.

I am the secretary of the agricultural society of my county, and in that position, I often have an opportunity of meeting our farmers, and of convincing myself that they are rather slack in improving their system of cultivation. I was desirous of affording them the means of acquiring knowledge, that they might extract from their land all its potential produce, and I thought that this could be done through the instrumentality of agricultural teaching.

For, we must not forget that we often speak of the farmers of Upper Canada as being very much advanced. True, they are advanced, but it is because they have been more highly favoured than we. They have not more skill, more intelligence than we ; but they take more pains they investigate, and they read the papers.

As for this commission, I hope it will not be too lightly found fault with, for its results will, I believe, be found satisfactory.

The learned lecturer, Mr. Provancher, observed that, in his opinion, the farm schools had not done what was expected ; but, at the same time, he acknowledged, as I, too, acknowledge, that this is not the fault of the teacher, but that it is due to the fact that the schools have never been placed in a position to give a satisfactory course of agricultural instruction. It is precisely this that is missing, and we have consulted together as to the means to be taken to render the teaching more complete.

On this subject I will not enlarge. I will not transgress the boundary which our president, Mr. Bernatchez, established yesterday, contenting himself with giving a sketch of his tour without drawing any conclusions.

But I would draw the attention of the meeting to the fact that instruction in farming matters should be given in Quebec, as it is in almost every country in the world.

It is said that the cost of this will be great; but nobody can complain very much if it be; no one can complain if the farmer is taught how to grow rich. He, himself, will have to pay for it, and can he be blamed very much for paying for his own instruction? Agriculture being the nursing mother of society, too much outlay cannot be made on her. Assist, then the members, and the agricultural commission, in accomplishing a work which will enable farmers to draw from the land all it is capable of affording: the work in question is the establishment of a proper system of agricultural instruction.

I should not wish government to make a great outlay in order to entirely reform the generation that is departing: when it goes, it will carry with it much of that routine work which has been the evil of the past, as it is the evil of the present. But I would concentrate my efforts on the instruction of the rising generation, and in this way reform our province, until we can say with truth that we are as successful as our friends in Ontario.

If we have not obtained the same results as they it is because we have not their advantages. The French-Canadian farmer is manful, industrious, intelligent; his soil is fertile; agricultural teaching is all he needs. I will say no more; only I will ask you to forgive the desultory form in which these observations of mine have been couched.

I thank you for the honour you have conferred upon me in electing me a director of this association, and for having asked me to address you. I did not expect to be asked to hold office, but since I have been chosen, I accept the charge.

Mr. Bernatchez.—Yesterday, when M. l'abbé Provancher, thinking the time a fit one, cast a word of accusation, if not of recrimination, against the government, I was satisfied with telling him that when he saw the report of the commission, he would be content. I said no more on the subject, because I did not think a meeting of the Dairymen's Association a proper place for a political discussion.

Mr. Provancher.—I did not mean to attack the government. You will find the same idea expressed in writings of mine that have been in print for 8 or 10 years. I expressed my personal opinion against measures that might suit the government, but I did not intend to accuse any one, much less the government.

I was very glad to hear from Mr. Beauchamp, that the commission was appointed at the request of the members of the legislature themselves. And this is why: the school-reports might awaken some suspicion; but are there not members of the Council of Agriculture who themselves go and

visit the Agricultural schools ? They surely, have no private interest in keeping up a school : why, then, this commission ?

Was this not another, or fifth, wheel added to the Council of Agriculture ?

Well ! I said in my lecture that the simpler the wheel-work the better it functioned ; it is already complicated enough by the Council of Agriculture, whose powers are not sufficiently defined.

And, now, another wheel is added to the coach ! There will be more friction than ever ; and, consequently, bad effects will follow.

Let others, if they will, hold a different opinion, every one is free ; but pray do not impute to me opinions I never held.

I may be wrong, but let me be convinced of my mistake. You are very wrong when you accuse me of having blamed the government, or any one in particular. I only gave my opinion on a matter of public interest ; if every one would do the same, the vision of the government would be all the clearer.

Mr Beauchamp.—I do not know if I made myself understood ; but for my part, I apprehended what Mr. Provencher said. I understood him to say, and he said it very clearly. that he only expressed his own ideas, without meaning to wound the feelings of any one, just that ; and I understood it exactly as Mr Provancher has just explained it.

Mr Bernatchez.—I do not wish to annoy any one, but, in my opinion it was not the proper time to discuss the question ; and it was for that reason that I replied to what the Abbé said in a more elaborate manner. I shoul l like to make many remarks but I refrain, seeing that this is not a political meeting.

Mr Casavant.—As a member of the council of agriculture, I do not feel myself at all wounded by the remarks of Mr Provancher. It is not the first time I have heard our institutions criticised. All do not see alike ; and when I spoke during the course of these deliberations, I even did not allude to the affair.

All organizations established by a man have their defects ; for men are liable to deceive themselves. But to determine the question which is in debate, we must go back years, and compare the farming of to-day with what farming was when the council of agriculture was instituted. We should then find out what changes have been brought about, and who gave the impetus by which these changes were accomplished.

But, as Mr. Bernatchez said, it is not a fit time for this discussion. For my part if I am addressing the meeting, it is only to say, in reply to Mr. Provancher's observations, that I do not believe that they were made with the intention of hurting anybody's feelings.

ON THE MODE OF INCREASING AND PRESERVING FARMYARD MANURE

Mr. J. J. A. Marsan

Mr. President and Gentlemen,

I beg of you not to expect a lecture from me: I have not had time to prepare one, which puts me into an embarrassing position; for I feel that you have a right to expect from a teacher of agriculture much more than I can give you at this time.

Trusting to your good nature, I will talk to you a moment on the production and preservation of farmyard-manure; I will do so in a familiar manner, just as I generally do to my young pupils; so great is the force of habit, that I must yield to it, even before a meeting whose knowledge and intelligence would seem to demand a loftier and better prepared style.

The few observations I shall make are addressed specially to practical farmers.

When we reflect on the numerous and enormous losses, which our Canadian agriculture incurs yearly, we must be astonished at the indifference and apathy which farmers, in general, display on this point, especially so when manure is concerned.

I can state, exaggeration apart, that the entire value of the urine is ordinarily lost, to say nothing of the solid matter; and in many farms $\frac{3}{4}$ of the value of the solids is also lost.

The causes of these losses are the following:

Defects in the impermeability of the floors of the stables and even of the stalls, the want of sufficient litter, or the absence of absorptive materials, animals being kept out of doors for the greater part of the day in winter, and the feeding out of fodder in the yards; and lastly, the absence of dung-pits and of care in the management of the manure, &c.

The floors are badly laid or full of holes, the drains are not staunch; so the urine runs through, and gets lost in the ground. If the urine remains in the drains without being absorbed, it evaporates and loses its ammonia (by decomposition), which escapes into the air under the form of carbonate, a most volatile gas; the organic essence of the manure is lost, to the detriment of the healthiness of the stable and cowshed.

Keeping stock and feeding them out of doors in winter, leads not only to a waste of food, but to the entire loss of the urine and all the soluble parts of the solid matters deposited in the yard.

The manure generally accumulates at the cowhouse door, and is left without care to be covered by the snows of winter. When the spring thaw comes, the liquid manure escapes, turning the yards often into a sort of slough, owing to the treading of the cattle, and combining with the rain and melted snow, runs off into the nearest stream.

In many cases, the horse-dung, not having been mixed with the cow dung, ferments too much, becomes *fire fanged*, and loses its ammonia and great part of its carbon.

The most surprising part of the carelessness of farmers with regard to their manure is, that we remark it in people of apparent intelligence, careful enough as to other things, economical, skilled in domestic matters ; people who would not hesitate to get out of their carriage in to the mud, and hunt about for a lost cent ; and yet, these very people suffer, with the most singular indifference, the loss of tens of dollars in the streams that flow from their yards or from their mixens.

To what then shall we attribute this carelessness, unless to ignorance ?

For, if the farmers were convinced that this mud trodden by their cattle, these torrents of reddish water which flow from their yards, this strong smelling vapour which exhales from their fermenting mixens, represent the value of several dollars,even of several hundreds of dollars on large farms mismanaged in this way, they would reflect seriously and compel themselves to apply a prompt remedy to the evil : they would quickly turn to profit these riches lost by their own fault.

The diffusion of special knowledge concerning all the branches of a farmer's business is not, it is true, the principal duty of this society ; but, as all the practical details on a farm where milch-cows are kept, concur in, and are connected with the production of milk more or less directly, to recommend and enforce by instruction the proper care of manure must be one of the duties of your society.

Before pointing out the means of preventing the losses to which dung is liable, I will try to give you an approximate idea of the amount of the annual loss incurred by the agriculture of our province in this matters.

The investigations of learned men and of experimentalists have shown that the weight of the urine of cattle exceeds the weight of their solid excrements, and that in its value as a manure,considered in reference to its

richness in nitrogen, the urine of the horse is worth thrice, and that of the cow twice, as much as the solid part of their dung. And this urine has not only a fertilizing value from its nitrogen but also from its phosphates and the other saline matters it contains.

Now, supported by the facts I have mentioned, suppose the entire value of the urine to be lost, and that, on most farms, not only the value of the urine but also that, to a considerable extent, the value of the solid part is not utilized, we shall not be far from the truth in asserting that in this province, nearly $\frac{3}{4}$ of the whole of the manure of our stock is not, for some reason or other, put to a profitable use.

This mass of fertilizing materials, completely preserved, properly heated, and applied to the land in a judicious manner, ought to increase our crops by a value of nearly $12,000,000. In this point alone our provincial agriculture incurs an annual loss of this important sum.

Now $12,000,000, capitalized at 6 o/o, is equal to a sum of $200,000,000. Would it really cost this to the province to increase its agricultural income by $12,000,000. Evidently not. Let all the farmers set to work in earnest, and, almost without opening their purses, they will each bring his share of savings and of increased products to this augmentation of wealth which I have shown to be so easily realizable.

In order to show you that these figures are not exaggerated, even if they are not much below the mark, permit me to quote a few lines from an article in the last number of the " Canadian Live Stock and Farm Journal " on the subject we are discussing.

" The quantity of liquid manure produced in one year by a pair of horses and six cows, is at present estimated at nearly 40 tons, or ten thousand gallons. This manure, diluted with water, would be a good dressing for 20 acres of land. The solid matter contained therein is about 3 tons, and is as valuable as guano. You will not be a little surprised to hear that it is worth in money nearly $200.00. Is it not worth while to save all this ? "

Now, supposing twice this number of cattle to be kept on a 100 acre farm (100 *acres* 118.18 *arpents Trans.*) we arrive, by this calculation, at a value of $400 for the manure produced. If $\frac{3}{4}$ of it be really lost, or not employed, there ensues a waste of $300.

What means have we, gentlemen, at our disposal to economise such a sum of money ? The means are few, simple, very easy of application, and within the reach of every one.

1. Let us feed our stock plentifully and keep them comfortable all the winter in the stable, only allowing them to run out of doors for a short time in fine weather during that season, and for a longer time or more frequently in the spring, for the purpose of taking the stiffness out of their limbs, causing them to inhale the fresh air, restoring tone to the system, stimulating the appetite, accustoming them to bear the sun, and, in a word, giving them enough exercise to improve their health, but not at the risk of losing their liquid and solid manure. 2. Make the floor of the stables and cowhouses staunch. Much manure is often lost through their not being so.

At a meeting like this, a year or two ago, an intelligent farmer expressed, in a very striking manner, this great truth : " A hole, " said he, " in the floor of the stable is a hole in the milk-pail !

There are many kinds of floors.

The cost of building and the comfort of the cattle would perhaps lead us to employ asphalt for the floors, as in certain parts of France ; but here it is forbidden by considerations of economy, for a square yard with its 6 inch depth of concrete, would cost $2 80, according to the Inspector of roads, &c., at Montreal.

Cement-floors, recommended by many in Ontario, labour under the inconvenience of being costly, hard, and slippery.

Brick-floors resting on a bed of hydraulic concrete, and covered with cement, are effectual and lasting, but are less economical than wooden floors. For many a year we must employ, in this country, for our stable floors, boards of red spruce or of hemlock, taking care to place a plank under the joints to avoid the necessity of a too frequent renewal.

3. Now, faultless floors alone will not suffice to preserve all the manure. Litter must be used, straw or other absorptive materials, which will preserve the ammonia of the urine ; or else, we must build liquid manure tanks.

Pease–straw, cut into chaff, is the best bedding, inasmuch as it increases the value of the dung much more than the straw of cereal crops, since pease-straw itself contains nearly three times as much nitrogen as ordinary dung, without reckoning that the manure being shorter will ferment more regularly, and be easier to handle in the spring.

So, instead of committing the unpardonable crime of burning the pease-straw in the field at harvest-time, as is, unfortunately, too often done in certain districts, where many pease are grown, they ought to be carefully housed, and used, at least, for litter : they would not only keep the cattle comfortable, but add to the fertility of the soil.

If these pease-straw burners knew exactly what losses they were incurring with deliberate intent, they would soon change their manner of acting. But we must not forget that chaffed pease-straw is much better for litter than uncut; the trouble must not deter us, for it is immensely profitable.

The litters, cereal and pease straw, will not suffice, particularly if they are scantily supplied, to prevent the escape of ammonia; for this purpose it is well to employ plaster and dry earth. The application of plaster as a re-agent, by decomposing the carbonate of ammonia and forming sulphate of ammonia, a less volatile salt, will preserve the nitrogen of the dung, besides acting as a disinfectant.

The plaster should be scattered two or three times a day over the bottom of the stables and cowhouses, and the daily amount used may be from about ½ pound to 2lbs. The latter quantity is recommended by the chemist to the federal government.

This outlay should not be debited alone to the preservation of the manure, since independently of its preservative and disinfectant properties plaster is itself a most active manure.

Dry earth should be in general use in the stables as an absorbent of urine. The best sort of earth for this purpose is bog-earth dried and powdered.

Turf, especially if from shallow bogs, that are surrounded by strong and calcareous soils, possesses in itself intrinsic value as a dressing for land. Farmers who have any in their neighbourhood should make an ample provision of it in summer, and every day throughout the winter some shovelfuls should be scattered in the rear of their cattle, and the open drains of the cowhouses should be filled with it.

They would soon find a great difference in the healthiness of their buildings, as well as in the quantity and quality of the dung at the spring-tide.

Sawdust, which is much used in town-stables, is valuable for its cleanliness, but I do not like it much among the dung. Still, when materials fail, it may be of great service in country stables, where, in the neighbourhood of the saw mills, it can be had for nothing.

With a view to the complete enrichment of the soil by the dung I should be tempted to recommend the addition, as an experiment, of a certain quantity of pulverized apatite or mineral phosphate to the plaster and a dry earth. This apatite is a manure which, employed in this form *i e. the translator presents, undissolved in sulphuric acid*, is considered to be insoluble; but mixed in this way with fermenting dung, the apatite will, without any doubt,

in contact with the carbonic acid, undergo a transformation which will render it soluble. This change will perhaps take place slowly, but it will be not the less real. Its employment will have the advantage of costing less than would the use of superphosphates, and the margin of profits would be larger.

The mineral phosphate of lime, pulverized *nodulus* is employed successfully in France, and ought to encourage us to make fresh experiments with our pulverized apatite, (1)

Besides using litter, dry earth, and plaster, there is still another way of collecting and preserving our liquid manure. It is the system of draining the liquid manure of the stable, etc., into tanks; but here, the practice of this plan would entail such an expenditure in the construction of the drains and other arrangements, that even people of means would be frightened at it. A liquid manure pump, too, would be required, and one or more liquid manure carts with pierced distributing pipes. Plaster, or sulphate of iron, would be necessary to disinfect the liquid-manure and fix the ammonia. Still, in spite of these inconvenience, the system of liquid-manuring offers indisputable advantage. In Switzerland, where all the dung is applied to the meadows in this form, the production of hay has been doubled.

Be that as it may, in our present circumstance, I think we ought to give the preference to the system of plaster and absorptives, as the most economical and within the reach of most people. This is, generally speaking, the practice we follow at the agricultural school of L'Assomption.

Nevertheless, I should like to see trials made as to the comparative value of the two systems. I trust that the experimental establishment of the federal government at Ottawa will not restrict itself to experiments on artificial manures, seeds, and fruit, but will try to solve the problem we have just been talking of.

The investigation of the different systems of carrying on the processes of farming is, in my opinion, of the greatest importance; it is, as regards our province, of most urgent necessity, and, as such, ought to attract the attention of our government.

(1) Lawes, Aitken, chemist to the Highland and Agricultural Society of Scotland and the late Augustus Voelcker, chemist to the Royal Agricultural Society of England, wrote to me in 1884, stating that *apatite* and all other *crystalline* forms of phosphate of lime, ought never to be applied to the land in an undissolved state. When applied thus to roots the results have been usually equal to "no phosphate", and the writer (Aitken) has never seen any effects produced by it on succeeding cereal-crop. The phosphate of lime used in France is, like the *coprolite* of England and the Carolina rock of the States, a non-crystalline form of phosphate of lime, and when finely ground is doubtless efficacious, Arthur R. Jenner Fust.

I have said enough, gentlemen, on the manner of collecting the dung of the larger kinds of stock. I have only to add a work on the management of mixens.

As the dung of all animals does not possess the same value as manure, or the same mechanical properties, it is by far the best plan to mix them all together, and, thereby, to let them mutually improve the quality of the mass. Cool dung, of cows or of hogs, heats more perfectly when mixed with the dung of horses, the fermentation of which is thereby slackened. The last being, when recent, more porous and more nitrogenous than the others, always ferments with greater intensity, and, in a short time, loses much of its fertilizing elements. It is this horse manure that requires the greatest attention, and the largest dose of plaster.

The fermentation of the mixen or dung heap is easily regulated by pressure. The more they are trampled down, the less will mixens, heat. If they are intended to remain a long time, they should be covered with a good layer of earth. If there is no bog-earth to be had, calcareous earth should be used. This earth will absorb the gases that try to escape, and will acquire the same properties as the dung itself.

On the dung in the yard, the pigs should be allowed to run. They will mix it, and the pressure will slacken and regulate its fermentation.

I am afraid, gentlemen, I am detaining you too long, and thereby abusing your good nature ; but I have only treated part, and that incompletely, of the question of farmyard dung. But I see in the audience men of experience in this business ; especially Mr. Casavant, who has had much practice in the management and employment of dung. To them I surrender the office of addressing you ; at the same time thanking you for your attention.

M. l'abbé Montminy.—Will Mr. Marsan kindly give us his experience in a matter that he only touched upon in his lecture? He advised us to let our cows out in winter, to let them take the air, to *unstiffen* (*dégourdir*) their limbs, and to stimulate their appetites. Once upon a time, I heard a lecture in which we were told never to let our cows out in winter : for my part, I should be afraid of offending my neighbours, were I to do so. I should be glad if Mr. Marsan would say a few words on the subject.

Mr. Marsan.—Whatever may be the general opinion on this point, my experience and my personal observation authorize me to say that cattle should be turned out for a short time every day in fine weather, during the winter, to refresh themselves, to breathe the pure, life-giving air, and to prepare them by degrees to support the sun of the springtide. I do

not turn them out in very cold weather, or in heavy snowfalls. The time they remain out is regulated by the temperature. When it is coldish, they only remain out as long as they keep on frolicking about ; as soon as they begin to stand about motionless, they are sent in ; they must not be allowed to shiver. They are carefully watched. When the fine spring days arrive, we leave them out for an hour or two, and during the bright, sunny days of April and May, the cattle often remain out from 10 A. M. to 3 P. M. As a general rule, they get no food while they are in the yard.

The practice of turning out cattle in winter is not unusual among good Scotch farmers, who send them for their water to a trough or a spring, to enable them to acquire healthy energy. This practice may be objected to as far as regards cows in milk or about to calve, but no injury is seen to be suffered by other cattle.

I have often observed that cattle that have passed the entire winter indoors, suffer much inconvenience when they are exposed to the March or April sun. This is a sign of weakness which can be prevented by a proper rule of feeding, but equally as well by frequent *spells* of outdoor visits.

As to this practice, I have never been guided by a fixed or absolute rule, but by observation and circumstances. I always have the dung that the cattle have dropped in the yard collected immediately they return to their stalls.

Mr. Casavant.—I have only a word to say on this matter.

For several years, I had two cowhouses ; one in which water was always before my cattle, and the other where there was no water ; the cows kept in the latter were taken to a stream to drink. Those kept always indoors seemed to do better a little during Winter ; but when spring came, those who were turned out every day were the stronger. Whence, I conclude, that the plan of watering them out of doors was the better of the two, and to-day, though my arrangements allow me to water all my stock in the stalls, I send them every day to drink at a spring, which is from 500 to 600 yards from the cowhouse. I send them in detachments ; as soon as one beast has returned, another starts, so that there is no confusion.

I only leave them out long enough to drink ; then they are driven home again and fed at once. I consider that cattle should remain out only as long as they keep in motion ; otherwise they become chilled, the blood becomes thin, and when the spring comes, the blood is considerably

lessened in quantity. Whilst, as long as cattle are all left out during the time they are in motion, additional strength is the sole thing they acquire.

All cowhouses should be well ventilated. If the house from which you turn out your cattle is as hot as a furnace, and close, it is certain that your beasts, on going out, will undergo a change which will do them great harm. But, if your cowhouse is kept at a moderate temperature, they will suffer no great change from heat to cold ; so that it will not hurt them to go out to water. And in Spring, they will be only the stronger for it.

I will touch on another point in Mr. Marsan's lecture which greatly interested me. I agree with him, that we lose thousands and millions of dollars through our negligence in not preserving our manure. I am not better than other people ; I lose my share of it. Still, my cow-house is so constructed that the manure falls into a dung-pit below, and to preserve it, I use plaster. I have read in a French paper that great gain is made by mixing apatite with all the manure. It becomes soluble and I was told that which they employ in France is more easily rendered soluble than that of this country. (1) Still, if it were to pass through our mixens, which suffer so intense a fermentation, I think that a great part of it would be rendered soluble.

M. l'abbé Montminy.—Did your cows give less milk when they drank cold water out of doors ?

Mr. Casavant.—Not a doubt about it. I must say that those who keep cows in the stalls for the production of milk in winter, ought not to follow this system. But I hold that the keeping of cows in milk at that season is only profitable near large towns. For the patrons of cheese factories, I believe it would be advantageous if their cows had a couple of months' rest.

From certain experiments, I have arrived at the conclusion that in order to keep cows strong, they must have a certain ration of hay every day, and what grain they have should be given them dry. I have completely given up the practice of giving mashes, and I feel that I have done well. As long as they are indoors, the cows are a little less strong, but when they go to grass, they are much more vigorous. Last year, I fi-

(1) Mr. Casavant is right. The phosphate of lime used in France is chiefly coprolites, a non-crystalline form. A. R. J. F.

nished giving my cows hay on the 25th May, and ten days afterwards, June 5th, I began to give them green meat, lucerne, as much as they would eat, and very well they did on it.

Mr. l'abbé Chartier.—It is not every one who has the means or the advantage of being able to make a dung-cellar. But both rich and poor can take care of their manure without any expense.

We "handle" a good deal of manure at the Seminary; this is not all put on the land in spring; some must be reserved till autumn. My way of keeping it is very simple, and anybody can follow it. We carry the dung during the winter to the spot where it is to be used; we put it in heap squared up, not letting it get spread about, and in the course of the winter, as our dung is all mixed, we do not suffer from its heating too much. We have not as yet been obliged to turn our mixens. I do not know whether this is owing to the moving it gets in winter, but we have not suffered from this inconvenience.

In spring, all that is not used is preserved for autumn use. We press it well, by making one or two horses get on the heap, until it is pretly solid under their feet, and then we are satisfied with throwing a load of straw on it. I know well enough that we might put something else, but our land is so level that we could not get earth without making a hole.

When autumn comes, all is consumed; no straw is left.

This is not a scientific plan, but it is practical, and should be done by every one. I relate it, because during the four years we have practised it regularly, our manure has neither suffered by rain nor by snow.

And I beg you to observe that these who visited our place must have found us much to be pitied with regard to our buildings; in spite of which (I had not an opportunity of convincing them of the fact), our floors are impermeable. We use a great deal of hay and straw; and we lose a small quantity of the urine, not having the means of preserving it; but I am certain that our manure is worth thrice as much, load for load, as what we buy in the town. I attribute this to the preservation of the urine and to its being mixed with the solid dung. What I wish you to observe is, that, the dung being rich, it is consequently much more subject to heat. Well! owing to the pressure given to the mixens, it does not heat. In autumn it is in the best possible state.

Mr. François Couture.—I will try to tell you how we preserve the manure at our farm.

The cowhouse is 30 feet by 45. There are two rows of cattle, with a passage in the middle, by which I feed my beasts.

The flooring is very simple. It is made of 1½ inch boards, of cedar or red spruce, and underneath it is clayed. The slope leads the urine towards the North, and in that quarter there is a door communicating with the dung-sheds. We have several dung-sheds some of which are not worth $30 ; but of the 45 feet that the cowhouse extends, I have dung sheds 18 feet along it. These are floored with clay. Pigs are put on the dung, and they tread it about, so that no one would believe that there was any straw in it. The solid part of the cow-dung remains below and the urine, the liquid, goes to the top. The lower part is always solid. The dung of the hogs is mixed with that of the cows. A pig may be wintered in this way without having any other food given him except the horse dung.

THE CULTIVATION OF LUCERNE AS FOOD FOR MILCH-COWS, EITHER IN THE FORM OF GREEN MEAT OR AS HAY.

Mr. Casavant

Lucerne, the cultivation of which is increasing more and more in Canada, has been known and appreciated in Europe for years and even for centuries. It originated in Asia. Without spending any longer time on its history, I will plunge into the subject at once, and begin by considering what sort of land suits this plant. It demands, in the first place, a deep and well drained soil The depth which, in other countries, may be obtained by successive trenchings, must be about four feet; if deeper, so much the better, but with the above depth of vegetable mould, the roots can develop themselves with ease during the first years of its growth, and are afterwards sufficiently hardy to penetrate and perforate the subsoil to a certain extent, and to live at its expense.

The surface of the field devoted to the growth of lucerne must be laid out so as to favour the escape of the water. A damp soil, let its other qualities be what they may, is of no use for this plant. Wherever water stands on the land in winter, there the lucerne is sure to die out. And the same with shallow soils, retentive ones, with land that is too flat ; in a word, all lands that are affected or unsettled by the frost are absolutely unfit for the cultivation of lucern. And yet, all these restrictions being enforced, how many soils are there which, on account of the facility with which they can be drained, though they offer no advantage for the cultivation of the crops generally sown here, yet might be used very profitably for the growth of lucerne.

Let us now see what are the good qualities of the plant itself. It is perennial ; that is, capable of vegetating for several years in the same land

without being resown ; it is tap-rooted. that is, its roots dive down vertically into the ground to a great depth. and only take the whole of the nutriment of the plant from the upper layers of the soil during the first part of its growth. From this great length of roots follows, too, the great resistance the plant offers to the effect of heat and drougth ; the hottest sun cannot arrest its growth, for it draws up by these roots from the subsoil, to a depth of several feet, all the moisture that is necessary for its interior and exterior life.

The lower leaves which detach themselves from the stalk and fall to the ground, enrich it, as do also the roots when the lucerne is ploughed up. Timothy, when mixed with lucerne, grows with great luxuriance, the two plants not injuring each other, the one having superficial, and the others, on the contrary, very deeply penetrating roots.

According to the experience I have gained on my farm, lucerne can be kept *in plant* for 15 and even for 20 years. Fields that I sowed in 1871 are still in perfect preservation and vigour. I will even add that at the time of its coming up I consider lucerne to be one of the least delicate plants with which I am acquainted ; it resists drought very well and the invasion of weeds does not seem to trouble it.

Harvest.—The first cut may be made from the 5th to the 10th of June; lucerne being then in full bloom.

The second cut, about the 5th to the 15th of July, a month after the former, and the third, and last, in the second fortnight of August.

The following is the rotation pursued in the field of which I mean to give in detail the treatment and the returns.

1880.....Pease.
1881.....Potatoes manured.
1882.....Fodder-corn
1883.....Wheat.

Since the last date, lucerne has occupied the field without a dressing of manure of any kind.

As to the crop, here are the details for last season :

On June 5th, the stalks were 35 to 40 inches long, and in full bloom.

I mowed it at once, and calculate I had, at least, more than 200 bun dles an arpent.

The second crop was cut on July 5th, the lucerne was then from 30 to 36 inches long. I believe I had nearly 200 bundles an arpent. As an

experiment, I left a small piece of the second cut on foot, to see if the seed would ripen properly. I was quite satisfied; the seed looked to very well, and appeared to have ripened capitally.

The 20th August, cut the third crop, which yielded about half as much as the first. (*about* 4 *tons* 2 *cents an acre. Trans*,)

How to make lucerne hay.

As soon after cutting as the lucerne is a little wilted it must be put into "grass-cock," and turned several times, if necessary, until it is thoroughly dry. These turnings must be done gently, without jerking is about, in order to avoid knocking off the leaves; these being the richest and most easily dig sted part of the forage, and every precaution must be taken to preserve them and to carry to the barn as much of them as possible.

Lucerne is certainly, in my opinion, the plant of all others the most capable of standing bad weather without suffering much; it does not get discoloured or break in pieces like clover. Well made and carried in good condition,it may be kept for a long time,and from this point of view again merits a high position among fodder plants.

In the cattle-house, all the animals of the farm without exception are ravenous after lucerne, be it green or dry; as a supplement to the pastures it is quick of growth; in fact, it is the most precious of all the forage-crops, since is comes into bloom at the beginning of June.

At my farm, we began to cut lucerne this year on June 5th, and gave it to the cattle as a supplement to the pasture. This allowed me to wait until the maize was fit for consumption. Apparently, each head of stock had from 25 lbs. to 35 lbs. of lucerne a day. I think it may be useful to add in passing that no change in the quantity of milk produced has been observed when the cows had their feeding changed from lucerne to green-corn.

Lucerne is more nutritious than corn, and yields much more than clover: it need not be chaffed before ensiling, which is a great saving, as any farmer who resolves to try it will soon find out.

All that has been said of the qualities of lucerne shows clearly that those who possess a silo would find in it an excellent food for conversion into silage.

I do not approve of pasturing lucerne; it wears it out, and the cows almost invariably injure the heart of it, by biting the plant too close to the ground.

I often leave the third crop standing to ensure the protection of my lucerne, and I find that the practice has a good effect.

To sum up : I would strongly urge my hearers, as well as my future readers, to make at least a careful essay of this crop. The risk is trifling ; the worst that can happen is meeting with bad seed. I almost dare predict that if the land selected be suitable, the seed good, and the harvesting done in fine weather, full success will, in ninety-nine cases out of a hundred, be the reward of those who shall have thus made an additional step in the path of progress.

THE ORGANIZATION OF A DAIRY.

Gentlemen,

You have often had very clearly explained to you the best way of proceeding to succeed in making the best dairy products. You have enjoyed the advantage of listening to eminent men, while they developed before you the different systems, and weighed their different merits. The reports of the Inspectors have pointed out the improvements which are making from day to day. Not to weary you by idle repetitions, I will limit myself to-day to speaking about the organization of a factory; whether it be a cheese-or a butter-factory, makes very little difference ; examining, first of all, to whom it ought to belong, whether to a tradesman, or to an association of cow-keepers, I shall next inquire into the way in which the milk should be procured, whether by purchase, or by manufacturing for the account of the patrons, closing by pointing out in a few words the sort of books that should be kept' and the most advantageous means of obtaining the necessary apparatus. I shall always speak of a creamery, but what I say will equally apply to a cheese-factory, the organization of both being absolutely identical.

Before proceeding any further, permit me to tell you, gentlemen, that these few ideas have no merit except that of being entirely my own. That, and my being a foreigner, may perhaps entitle me to your kindness. If there be another title which may tell in my favour, it is that, having become a butter maker by the greatest of all possible strokes of fortune, I have kept but one end before my eyes : that is, to arrive at the best possible results, keeping above all things the interests of my patrons in view. I think, gentlemen, that is the common ambition of all the members of our association.

When the necessity of establishing a factory makes itself felt in a parish, the principal milk-producers, the future patrons, generally meet together, and look for some means of arriving at their object. Two alternatives present themselves : the former is to find a tradesman who will agree to come and set up a factory in their midst ; the other is to club together, and build a creamery themselves. If their search is successful, and a tradesman will consent to establish himself in the parish, bringing all the necessary apparatus with him, the problem is quickly solved.

Unfortunately, and you know this, gentlemen, as well as I do things do not always get settled so quickly as this. Good makers are not even now too easy to find. Rarer still are those possessed of sufficient capital to start ton their own account. It is true, that, on the other hand, we may perhaps find a proprietor or a shopkeeper in the parish who means has enough. But he does not understand the business ; the information he may possess on the subject is often incomplete, or wanting in precision. He would, decidedly, like to be useful to his neighbours, but would his wish to do an act of kindness have the effect, if carried out, of injuring his own interest ? He hesitates ; shuffles ; dares not. In shor : no factory !

Left thus to themselves, there is nevertheless, a resource still left to the patrons : it is to divide the necessary capital into ten, twenty, or thirty parts or shares, and to erect themselves into an association.

Theoretically, it is this mode of organizing an association which is the best from all points of view, as much as regards the excellence of the articles produced, as the interest of the patrons.

Indeed, who may be said to be born directors ? Those who are chiefly interested, the most influential, the most intelligent, the best informed of the patrons. Suppose for a moment that in a certain locality there are sixty patrons who supply milk. Admit, again, that twenty of them are pecuniarily interested in the enterprise. It is these that will take the greatest quantity of milk to the factory ; they have, then, every interest in the work there being carried on in the best possible way. These shareholders will choose from among themselves a few members to form a committee of management, to look after the choice of a maker, the fitting up of the factory, the sales, and, in a word, to watch over the general interests. The annual profits, divided proportionally, will form a genuine dividend. This dividend will diminish by so much the price every one has to pay for the butter. Thus, at the end of a few years the chief shareholders will end by having their milk converted for almost nothing, and, at the same time their capital repaid them !

To illustrate this by a few figures, let us take, as an example, a creamery the capital of which, $2,000, has been subscribed in shares of $100 each. A patron, holding one share, will take an average of 100 lbs. of milk to the factory daily, for, say, only 5 months. This will give him, in round members, 650 lbs. of butter in the season. If his butter fetches 20 cents a pound $104 will be due to him, less the 4 cents a pound charged for making, and representing a sum of $26. If the net profits of the factory are only $500, his share of them will be $20. He will thus have only $6 to pay instand of $26. This is, then $14 less than a patron having the same quantity of butter but not being a shareholder would have to pay. His investment will have paid him 20 o/o, besides furnishing him with the means of disposing of his milk.There is no exaggeration in these figures,for you know better than I, gentlemen, that many a factory realizes a much larger profit than $500 a year.

A company established in this form is absolutely master to choose this or that maker as it pleases. He is hired for the season, and need not be necessarily re-engaged when his time has expired.

The maker who shall receive there a larger salary than is paid elsewhere, will do his best to satisfy his patrons, and obtain a renewal of his engagement. A sort of emulation will quickly arise between makers, who will look after such situations as these in preference to all others, and earn a reputation in proportion to their merits. I doubt not but that this will tend greatly to the improvement of the products of such factories.

In another parish, on the contrary, when the factory belongs to the maker, it may happen that owing to the inferiority of the butter, to innumerable difficulties, whether they be owing to the maker's incapacity, to his disposition, or to his pecuniary embarrassments; it may happen, I say, that the patrons are utterly dissatisfied; they are nevertheless obliged to retain a man who is a burden to them, who depreciates the value of their articles, and neglects their interests.

These, I assert, are indisputable advantages, as much as regards the quality of the products, as the interests of the patrons. So, a factory established in this way will be superior to any other. And yet, the reports of our inspectors are there, to tell us that it is these very ones that function the worst. The causes of this are numerous. First, the general carelesness and too little attention of the patrons; no one is affected so directly as to take the initiative in ordering some pressing repairs to be done or to assume the responsibility of any urgent reform. Then, gentlemen, we will not look beyond our poor nature; jealousy, personal ambition, mean grudges,

take sides in the game; personal interest presses upon and smothers the general interest. The committee of management resembles a political coterie. disunion and discontent mix themselves up in the bnsiness, too often, unfortunately, to the utter disorganisation of the business.

The question is then, as to this point, decided, that cooperation creameries are, theoretically, those that function the worst. What conclusion shall we deduce from that ? Must we from some difficulties in the details, throw aside a system so excellent in it itself? To do this,I think, would be to aim a severe blow at the dairy-business. It would be easy to reduce the number of shares, to increase each man's individual interest, to leave to the directors more liberty of action, to the maker more power of initiating reforms. Lastly, the establishment of wisely elaborated rules, to be distributed throughout the parishes by means of our association, would greatly assist in the founding of these associations, the regular working of which will place them, without any doubt, in the first rank of the factories.

When a factory is definitively established, whether it belong to a tradesman or to a company, the question of life or death for it is, to pursuade the farmers to take their milk to it. There are two ways of doing this.

The most apparently simple one is to purchase the milk. Many have tried this, but few have succeeded. It is certainly very easy to establish a price sufficiently remunerative to the maker. But, in spite of all the contracts and agreements in the world, how can the patrons be compelled to still keep on bringing their milk, or to bring the whole of it, when the price no longer suits them, and when they hear that in a neighbouring parish, some cousin of their is getting five cents for the hundred pounds more than they ? They will force the maker to pay more for the milk; the latter, in order not to fail, will yield—hoping reap to the benefit at a later period—this later period never comes, or not quickly enough; should the market-price fall, the maker runs into debt to pay, or does not pay at all; distrust ensues, and with it come constant quarrels, daily disputes, and, lastly, bankruptcy, bringing in its train the closing of the factory ; the patrons lose the value of their milk ; the place falls into disrepute; no one dares to undertake again what has already failed so completely, and the parish which under another system, would have realised considerable benefits, finds itself deprived of the advantages that a good factory invariably brings with it.

I do not say that on this account we should never purchase milk directly, not ; there are places where it can be obtained advantageously. I

would even recommend this system to factories near large towns, where fresh cream, fancy butter in small pots, or small, fine cheeses, can be sold by retail; and I would advise the proprietors to make nothing for exportation except with the excess which is not consumed at home. This method of dealing, although very profitable in itself, will not fail to excite the distrust of the patrons, and to complicate the book-keeping. Still, I think that a maker placed in such a position, and buying his milk directly from the farmers, would have a good deal more elbow-room.

The second way of procuring milk, you are all acquainted with: it is to make the goods on the patron's account, taking, for your pains, a certain fixed sum for the pound of butter or of cheese turned out. It is this that suits people almost everywhere, and it gives the least trouble. It fits thoroughly into the ideas of co-operative societies in general. In this, all have their interest in common. The task of the maker becomes by so much the lighter as each of the patrons finds it to his advantage to help him to succeed.

The sum retained for making is generally fixed at 4 cents a pound for butter, and 1½ cent a pound for cheese. It is not too much, for as to butter, the tub, the salt, and the packing have to be paid for in addition. The factory, then, has to treat the milk with the greatest possible care, for the more it yields, the greater the gain to the factory, its profit depends on the profit of the patron, and the latter finds it to his advantage to take good milk to the factory, because it will yield him the most butter.

Besides, an intimate co-interest *(solidarité)* is thus formed between the patrons and the maker: the latter is no longer at the mercy of the variations of prices, or of an invariably disastrous competition. On the quality of the products, and consequently on the sales, will always depend the confidence the patrons have in him. Without this confidence, the factory will soon close. Every day, and for each patron, an account is kept of the quantity of milk delivered. The total weight is added up every week, and divided by that of the butter and cheese made, which gives as the quotient the number of pounds of milk which it takes to make a pound of butter or of cheese. With these rudiments, only a simple calculation is necessary, on the day of sale, to assign to each patron the sum that is due to him.

There is an account-book published expressly for butter-and cheese-factories. The presence of its compiler forbids me to mention him here. All that I can say about it is that by following out its directions completely, no errors can be made in the accounts. Tables will be found in it showing the yield, and the loss by drying, the delivery to the dealer and

the amount of the same, a model pay-sheet, and a memorandum of sales and of the annual production. A special chapter is devoted to the principles of the division of profits. Some elementary operations will show how to make up with quickness and exactness the account of each patron, without being obliged to refer to a special accountant. I think, gentlemen, that I have said enough about this book to assign it a place in every factory.

To wind up what we have been studying about the organization of factories, I have only a few words to say on the necessary apparatus. The cost of this is not so great as formerly. The capacity of the centrifuges and their numerous improvements allow the treatment by one machine of quantities of milk that a few years ago would have required two. Thus, with one large Danish centrifuge, the milk of from 500 to 600 cows can be dealt with for the whole of one season. And there exist reliable companies, which furnish new establishments with everything necessary for their proper working, saving the directors from the worry of eternal letter-writing, and from inquiries which are always troublesome, particularly in the country.

It is an immense advantage to the farmer, desirous of establishing himself as a factory proprietor, to be able to obtain on very easy terms, and by addressing himself to one firm alone, all the utensils he wants, such as, centrifuges, engines, boilers, vats, presses, churns, thermometers, etc. This, in my opinion, constitutes a great step in advance, and cannot fail to aid immensely in the development of the dairy industry.

Thanking you, gentlemen, for your kind attention, I bring these remarks to an end. Allow me, however, to say, that in setting before you these few ideas, I have had no other object than, instead of giving a lecture, that of attracting the attention of specialists, many of whom are present, to these points. I know full well that their investigations, turned in this direction, will indeed throw great light on those problems which I have touched upon, without pretending to solve them.

PAUL GARRIGUE.

Quebec, January 10th. 1888.

TO THE HON. PIERRE BOUCHER DE LA BRUÈRE

PRESIDENT OF THE DAIRYMEN'S ASSOCIATION OF THE PROVINCE OF QUEBEC

SIR,

I have the honour to submit to you my report, as inspector of the above association, for the last year :

During the season of 1887, I visited 111 cheese-factories; and of that number I paid a second visit to 18; I also devoted 70 days to giving instruction in these factories.

From observations made during this inspection, I am induced to class these cheese-factories as follows :

First Class	60
Second do	49
Third do	2

Nevertheless, I must beg you to observe that, in my opinion, the second class cheese made now is as good as the first class cheese we used to make five years ago.

I found that the manufacture of cheese this year was much more difficult than in former years, both on account of the great heat that prevailed in it, and because these factories in general are not built in a way that enables them to resist the evils caused by intense and prolonged heat. These two inconveniences have contributed to the *heaving* (1) of the cheese which was made last summer.

We were, first of all, inclined to think that in order to prevent cheese from heaving, it was necessary to cut it twice with the curd mill. But we have learnt from experience that a homogeneous cheese—*i. e.* one without holes—can be made with only once cutting.

The following is the proper process :

The cheese is made as usual ; at the expiration of the second hour after the beginning of the process, the whey is let off, and after the curd has taken, if it is porous, it is cut with the curd mill, and stirred continuously for a quarter of an hour, or nearly so, without being salted. The stirring must be renewed every quarter of an hour until the holes vanish completely even if this operation takes two hours or even two hours and

(1) To heave, *avoir des pores.* Trans.

a half, during which time, the temperature must be kept at 96° F. When the holes have entirely disappeared, the salt can be added, and in half an hour the cheese can go to press at a temperature of 80 to 82 degrees.

During my inspection, I remarked with regret that many of the factories are so built that a proper temperature cannot be maintained in them. This is the cause of immense losses to the Province.

I also found that much loss was occasioned by inattention to the steam pipes; many of the valves were not hermetically sealed, and I observed several other defects, which the manager, though he was aware of their existence, seemed to think unimportant.

There were losses in many factories occasioned by different defects; the chief of which I will mention: 1. Insufficient knowledge of the qualities of milk: 2. the employment of the rennet not understood. 3. want of skill in colouring the cheese: 4. the improper heating (*cuisson*) of the curd; 5. The development of too much acidity: 6. defects in the buildings: 7. different causes producing holes in the cheese.

School-factory.—During the last season, 57 pupils, or rather cheese-makers, all of whom had had a twelve month's practice or more, came to study at the school-factory of N. D. de St-Hyacinthe: they passed, altogether, 148 days there.

The whole respectfully submitted.

J. M. ARCHAMBAULT,
Inspector.

St. Hyacinthe, January 10th, 1888.

Note.—As to the process of which Mr. Archambault speaks, we must warn cheese-makers that important changes have been made in it this year, which are shown in the "table of manufacture" sent to all our members. This remark applies to the reports of the other two inspectors.

TO THE HON. COMMISSIONER OF AGRICULTURE AND PUBLIC WORKS, QUEBEC.

Sir,

I have the honour to report to you that, as inspector of butter and cheese-factories, I have visited, during the working season of 1887, 75 factories, of which number 26 were creameries, 40 cheese-factories, and 9 combined butter and cheese-factories.

I spent a whole day, each, in 69 of these factories.

The following table, taken from my notes on each factory, will give, in brief, information sufficient to enable you to form an idea of the state of each of these factories.

When I compare these notes with those of last year, I find that great improvement has been made in the manufacture of the articles in question, but especially in that of cheese. Nearly half the factories I visited this year were making first-class cheese exclusively ; whereas, last year, not more than one-fourth of them were doing so. Cheese of third-rate quality is hardly to be met with nowadays ; yet it is only two or three years since some of it could be found in most factories. The new, or Cheddar process, has greatly contributed to this rapid improvement in the quality of our cheese.

Defects in the construction and arrangement of factories are evidently disappearing ; everything is in a condition of improvement. In some factories, wooden vats for the whey have already been replaced by metal ones. In vats of the latter kind, which ought to be emptied and washed out every day if possible, the whey keeps sweet, and the cans in which it is carried are not tainted as they would be with whey kept in wood-vats,which contain enough rottenness in the staves to infect and spoil in a few moments 1,000,000 lbs. of sound milk. From this, we can judge of the effect produced on a few thousand pounds of whey after having been kept in the wood-vats from 18 to 20 hours, as is the invariable custom, and of the difficulty which the patron finds in making the can clean enough to preserve the milk he sends to the factory in a sweet condition, a state in which, if the patron is a little careless, it does not always reach the factory.

The imperfections which occur in cheese in connection with bad colouring and faulty rennet, are not very common, because the colouring matter and the rennet are now always bought ready for use.

The improvement in the quality of cheese has not been equalled by the improvement in the quality of butter. The greater part of the butter made in our creameries, though considered good and fetching the highest market price, is not, except now and then, what may be called really well made. It is not made to keep ; it contains too much foreign matter, and sometimes the grain is broken, which invariably depends upon the churning or the mode of extracting the buttermilk : the churning is generally in fault. Instead of putting the cream into the churn at a temperature of from 55° F. to 58° F. during hot weather, it is churned frequently at 60° F. and upwards ; very often at from 64° F. to 68° F. In these cases, it often happens that the gathering of the butter in small grains is impossible ; nothing but great lumps can be obtained and in these

lumps is enclosed such a quantity of buttermilk that no amount of working can extract it. This hard working has, almost invariably, the effect of bruising the grain, and, in consequence, the butter has two most important defects ; it is impure, and the grain is bruised, and hence it will not keep, even for a moderate length of time.

There are many butter-makers who, although they do not follow the rules laid down for the best modes of manufacturing the article, yet still think they make butter of the best quality, would be surprised perhaps were they to taste their butter two or three months after it had left the factory. They might then be convinced that butter made in such a fashion that the grain is bruised, or that it contains too much foreign matter, will not keep.

I have remarked the existence of one fault that is generally too common in our creameries, and that is that there is not enough water, or, if enough, it is too warm and there is not a sufficiency of ice to cool it. From this cause many thousand pounds of butter are spoilt ; in which case the maker is blamed instead of the proprietor. There are creameries in which, at certain seasons, the best maker in the world cannot turn out good butter.

This year, I visited nine factories in which butter and cheese are made from the same milk. They were generally in good order. Still, I must say that in some of them the butter might be of a better quality, for the makers seem to neglect this article and to devote their whole attention to the cheese. Butter deserves as much attention as does cheese ; both should be equally well made, otherwise it would be better to avoid the combined manufacture altogether. About $\frac{4}{5}$ of the skim-cheese that I saw during my inspections was of good quality, and that which had $\frac{1}{4}$ or $\frac{1}{3}$ of the cream taken from it, sold, as far as I know, for about a cent a pound cheaper than good full-milk cheese. I saw some sold at the same price as ordinary full-milk cheese.

The results of this manufacture for the past year must have been generally satisfactory. The number of combined factories, instead of decreasing as one would have supposed during the last few years, has increased a little every year, and so it will be as long as our dealers buy the skim-cheese, and pay as high for it as they do now.

According to my observation, it is the manufacture of cheese that has made the most rapid progress. This being by far the more considerable in this province, more attention has been given to it than to butter, though the latter is of equal importance. It is very desirable that the government

should open new schools for practical instruction, and this is, I believe, the general desire of all who concern themselves with dairy matters. In my opinion, we require two new factory-schools for butter and cheese, more especially as regards butter. There is, indeed a butter-school in the Saguenay district, but it is only useful for the instruction of that part of the country. In certain places in the neighbourhood of Montreal and Quebec, I believe that schools might be advantageously established. We have ocular evidence to-day of the good to be done by one school well managed. Thus, we have St. Hyacinthe and its vicinity, whence comes the best cheese made in the province; and this superiority derives from that well kept school, in which cheese-makers are taught their business, and which has been in operation for several years. With new schools of this kind, the teaching of the itinerant inspectors would everywhere have twice the effect.

But to attain the greatest degree of usefulness, those schools must be very well managed. In the first place, the teacher must be perfectly competent, and, next, the factories must be well fitted up; not extravagantly so, but in a practical and economical manner, so that butter and cheese of the finest quality may be made in them.

Very useful would those schools be in teaching how to analyse and test the value of milk, in both of which arts many makers still fail. The instruction given by an inspector on his tour has its value, but in general it is not sufficient for the maker unless he has previous knowledge of the above arts. A few days attendance at a school, where he would practice under the professor, would enable him on his return home to exercise the desired discrimination on the milk of his patrons. The thing is of importance; for a pretty large quantity of milk partially skimmed or diluted with water, is passed into those factories in which sufficient watchfulness is not exercised.

An increased number of makers are enrolling themselves as members of this association. In my inspection tours, I was often invited to visit factories that had never been visited before. This is one proof among others, that the Dairymens Association is of some use, or that to be a member of it is of some value.

Respectfully submitted.

J. L. PAINCHAUD.

TO THE HON. J. McSHANE, COMMISSIONER OF AGRICULTURE AND PUBLIC WORKS.

SIR,

I have the honour to submit to you a report of my visits to the dairy establishments of the province which I was instructed to inspect during the course of last summer.

According to orders received through the Secretary of the Dairymen's Association, I traversed the counties of Bellechasse, Dorchester, Beauce, Levis, Lotbinière, Mégantic, Arthabaska, Nicolet, Champlain, Portneuf, Charlevoix and Chicoutimi,in which counties I visited 74 factories, of which 66 were cheese-factories, and 8 creameries.

I should like to have repeated my visits in certain parts, but having been detained a month at Quebec to help in preparing for the provincial exhibition, I was obliged to restrict myself to a single visit.

CHEESE FACTORIES.

I do not mean to be hypercritical, still I am obliged to say that not by any means are all the factories I saw of the first class. This state of things is not however any reason for despairing of the future, seeing that everywhere there is an evident desire of arriving at perfection. A general enthusiasm clearly pervades the factories, if I may judge from the eagerness with which their managers received me : they all seemed anxious to put in practice the suggestions made to them for the improvement of the quality of their goods.

The 66 cheese-factories visited were supplied during the season by 2562 patrons, who brought to them daily 196,600 lbs. of milk, the produce of about 13,200 cows. Calculating that it takes 9½ lbs. of milk to make a pound of cheese, and that the season lasted 4½ months—about 120 days— I find that the total of cheese made amounts to 2,483,368 pounds.

After careful observation, I came to the conclusion that of this quantity of cheese there was nearly one fourth of second and third quality. The manufacture of this inferior cheese costs as much as the best, and it sells for two cents a pound less—a dead loss of $12,416.86—and that only in the district included in my tour ; a loss certainly considerable and worthy of the attention of those who are working in favour of the dairy-industry. And more ; this cheese, good and bad, is exported, so besides the money-loss, our reputation as cheese-makers suffers greatly.

There are many reasons for so much inferior cheese being made, but I will mention only the following chief ones : 1. the bad condition of the

milk when it arrives at the factory: 2. the want of skill of some of the makers ; 3. unsuitable buildings ; 4. defective apparatus.

In order not to hurt any one's feelings, I reserve the details for the Dairymen's Association, to which body I have sent a complete table, showing the mark of merit assigned to each individual maker. Here, I will only say publicly, that out of the 66 cheese factories mentioned above, there are only 30 which are acceptable—and of these some are not first classs—; the rest are very moderate, especially as to their buildings.

I cannot, however, continue without saying a word about the county of Chicoutimi, which deserve special mention, since I found there the best dairy-establishments; and if we consider that this county does not enjoy the advantages of others, as regards its distant situation and its lack of rapid communication, the fact of its present progrees must be a good omen for the future, and serve in some sort as a model to other counties, less favoured as to communication, etc. but where the desired attention to this important branch of our industries has not been given. This county has had the good luck to profit by the zeal and intelligence of certain truly devoted men whom I had the honour to meet there ; such as Mr. Firmin Paradis, who is at the head of several factories, and Mr. Paul Couture, M. P., proprietor of one of the best creameries in the province, which is under the skilful management of Mr. Octave Couture, the proprietor's son.

As to incapable cheese-makers, although I am compelled to admit that there are such, I can say with pleasure that they are not numerous, thanks doubtless, to the teachers sent out during the last few years by the Dairymen's Association. Still, a certain number, while they possess the necessary knowledge, do not possess the qualities necessary to enable them produce good cheese : they are careless, idle, and dirty about their work.

A knowledge of the quality of the different samples of milk is one of the chief requisites of a factory-manager, and in this many are defective. This point may be easily determined by instruments constructed for the purpose, but many makers do not understand their use, so that when a dishonest patron—and there are such, I regret to say—brings skimmed or watered milk to the factory, these makers cannot detect the fraud. It would, therefore, in my opinion, be desirable to publish and distribute the lecture given, in 1883, by Mr. J. de L. Taché, the secretary of the Dairymen's Association, at one of its meetings. As this lecture explains clearly

and with precision, the means to be adopted to judge of the quality of milk, every maker, whether of cheese or of butter, might profit by its perusal.

Creameries.

If I expatiate largely on the subject of cheese-factories, without taking much notice of creameries, it is not because I do not feel interested in the latter—on the contrary ; I wish they were more numerous in the province —but because I hold that our cheese-factories are in a less flourishing condition than the creameries, which are, in general, pretty fairly conducted ; still, among those I visited, some were badly constructed, especially as to the apartments wherein the butter is kept. In spite of this, I find that out of 34,150 lbs, of butter, which I saw in the eight creameries I visited, there were only 2,400 lbs. of inferior quality ; too much doubtless, but the proportion is much less than with the cheese. When I speak of the inferiority of the butter, I mean that which has been badly made ; for butter, be it well understood, instead of improving, like wine, by age, loses in value every day after it is made up. Hence, the importance of marketing butter as fresh as possible, because by that means one gains both by its quality as well as by its quantity.

To remedy the defects I have noted in the most effectual manner, I think the best way would be to do our best to persuade farmers to take the whole of their milk to the factories. There is no doubt that in the parishes I visited the quantity of milk taken to the factories might be doubled or even trebled. In this case, as the work does not increase in proportion to the quantity of milk received, the factory proprietors could more easily equip more suitable factories, provide better apparatus, and engage better qualified makers.

Hence, the importance of lectures being given in our country villages on this subject, which duty we, the inspectors, could discharge during our visits, giving previous notice thereof to the proprietors of the factories who would, themselves, invite the patrons to come to the factory on the evening of our visiting them, when we could talk to them about the importance to them of producing the greatest possible quantity of milk and taking the whole of it to the factory or the creamery. They should also be taught the necessity and the manner of taking care of their milk, so as to bring it sound and pure to the factory ; for I believe we should have more influence with the patrons than some makers, who, while they know well how to make good butter and cheese, have not the authority necessary to make their rights respected ; while strangers, like us, being

supposed to know no one personally, might call things by their right names without fear of hurting the feelings of the patrons. I know perfectly well that this enormous increase of the inspectors' work would necessitate extra payment, but the cost would be as nothing in comparison with the benefits conferred. We might also continue to lecture during the winter-months, especially in the parishes where the dairy-business has not yet taken root. We might even pay a second visit to the places where one of us lectured in the summer,and I do not think we should be unwelcome, for I have sufficient proof to the contrary in the avidity with which the people resort to our lectures, when, during our tours, we are invited to speak on these subjects.

In conclusion, Sir, I trust that the project, which I know to be under consideration, of establishing an experimental farm in our province will be shortly realized.

In my opinion, there is no doubt but that such an establishment would be the spring whence our young people might and would draw the information so necessary to the successful cultivation of the soil, and thus assure the so much wished for development of agriculture in our province, which in every respect possesses the requisite elements of advancing the prosperity of a country, and especially, that of which the people have for a motto : Let us take possession of the land.

The whole humbly submitted,

SAÜL COTÉ,

Inspector of factories and creameries

St. Flavien, Nov. 2nd. 1887.

NOTES OF INSPECTIONS, BY Mr. JOHN MACDONALD.

Mr. President and Gentlemen :

In 1887, being in the service of Mr. J. M. Archambault, at the school-factory of St-Hyacinthe, I paid about 45 or 50 visits to factories. I have been asked to condense the observations I made during these visits, which I forthwith proceed to do :—

1. The buildings are generally defective, in the sense that they are not sufficiently well made to protect the cheese against the influence of the external temperature.The cheese-room ought to be situated in the lowest story; and in addition to the outer wainscot, this room should have an internal one, so that a layer of air may always exist between the two wainscots.

In this way the room could be always kept cool in hot weather, and warm in cold weather. By far the greater number of the factories I visited are badly fitted up in this respect. I have even seen some that have nothing but a poor exterior boarding, through which one could see daylight. In such factories it would be impossible for the best cheese-maker to get his cheese to cure properly; he might make good curd, but the cheese would never be of the best quality; the temperatue of the cheese-room being too high, the cheese would ripen too quickly, and would become "off flavour" in a short time. This result is inevitable, when the heat of the cheese-room keeps between 85 and 90 degrees, Fahrenheit, instead of being as it ought to be below 80°. The best temperature is 70°. In Autumn, on the contrary, in defective factories, the cheese does not ripen at all, and it happens there, as it did last year, that a lower price had to be accepted, and even contracts made at very high prices had to be cancelled.

2. I observed one very general fault in the way of delivering the milk at the factory. Some patrons come at five o'clock, and many others two and even three and four hours afterwards. The consequence of such delays is that the maker not being able to begin his work, the milk ages, and even turns sour in the time it is kept waiting about. During hot weather, this is fatal to good cheese-making. In the summer season, to succeed, the maker must excite every nerve to get his curd to attain the proper degree of consistency before the whey sours. If, on account of the advanced condition of the whey, it is necessary to draw it off before the curd is firm, there will be a loss both in quantity and quality, because, in this case, the curd must be stirred dry to get it to harden, and this diminishes the yield, and cannot be allowed to take the place of the usual process: besides, the curd will be comparatively soft, and the cheese will never be of the best quality.

3. To make good cheese, the milk, in its general character, must be of good quality. Milk that is sour, that has a bad smell, or that is dirty and full of all kinds of impurity, must therefore be refused. The patrons should understand this, and when their milk is refused they should not get angry with the maker, who acts for the common good, but they should try to correct the above faults.

4. The apparatus at the factories is far from being perfect. The fittings of some of them are such that nothing really good can be made in them. One alteration which should be made in all the Cheddar-factories is to replace the siphon by a tap placed at the end of the vat, with a strainer fitting with a socket into the neck of the tap. The whey should be drawn

off rapidly, and the siphon does not usually run it off quickly enough. Again, at the beginning of the season, the maker should examine all the pipes of his vats, and set them going, after having taken off the top of the vat, to prove that they are in working order. In the same way, he ought to inspect the boiler, the cocks, and the rest of it. I have seen cheese completely spoilt, and that for several weeks is succession, by a cock that did not close completely. The steam got in under the vat while the dry curd was lying on its bottom, and the curd was burnt without the maker observing it. In every case, whatever part of the apparatus does not work well must be replaced or repaired. The proprietors, in their own interest, as well as in that of the patron and the maker, should furnish the factory with all the improved utensils. Under such conditions, the cheese-maker who understands his business will make cheese that will bring the highest price in the market.

5. I have observed in several places an attempt to engage makers at reduced wages (*au rabais*). In general, the proprietor of an important factory will get good men for a reasonable salary. Cheap makers to will produce low-priced cheese. It is within my knowledge that makers have come to the school-factory who did not even know how put the rennet to the milk and stir it properly. How could such men get engagements unless they took low wages ? I have also seen cheese made by these low-waged makers, and all that I can say about it is that I never had the least idea that such stuff could be turned out. And as a reward for having engaged such people at $20 a month, the proprietors of these factories had on their hands cheese by which they were bound to lose at least $2 or $3 a box. It would be better to close the factory than to carry it on under such conditions.

The above are, in brief, the most striking remarks that suggest themselves to my mind. In conclusion, I think all makers should be advised to conform as much as possible to the alterations in the process of manufacture that are introduced, and which are practically taught them by the Association. We are not yet at the end of these changes ; there is a constant improvement in progress, and if we do not wish to be outrun by our rivals, we must keep up with the march of improvement.

Discussion of the Report of Mr. Macdonald.

Mr. Bernatchez.—Will Mr. Macdonald tell us if it is possible to make coloured Cheddar cheese without it being spotty ?

Mr. Macdonald.—I do not think the Cheddar process prevents the employment of colouring matter.

Mr. Bernatchez.—Purchasers, even in Ontario, tell me that they cannot get coloured Cheddar without white spots. How is the colouring managed in the Cheddar process ? If Mr. Macdonald knows how it should be done, it would be a matter of importance if he would communicate it to us.

Mr. Macdonald —I have only had one year's experience with coloured cheese, but I had no trouble in learning how to make it. I dissolved the colour thoroughly in water, and added it when the milk was ready for the rennet.

Mr. Côté.—Do our buyers find any difference between our present Cheddar, and the cheese made after the old way ?

Mr. Wilson.—Coloured Cheddar is as well managed as the old sort of coloured cheese. I see no difference between the two. But sometimes it is very hard to make the colour mix, I have seen a great deal of Ontario cheese, but I have never, or very rarely, seen any spotty cheese from that province.

Mr. Bernatchez,—The Messrs. Warrington told me that it was very difficult to colour Cheddars properly. The cheese is well made with the exception of the white spots; I only asked for some explanation that a remedy might be applied to this fault. I value the Cheddar process, and it is the one in use in our factory. I speak on the subject from experience, as we have lost money by it.

Mr. Archambault.—I think, Mr. Bernatchez, that these spots in the cheese are possibly due to currents of air that pass over the cheese. In spring and autumn, a sort of froth sometimes forms on the surface of the milk, and if this is not immediately removed, it will cause spots on the milk. These are the two causes. All cheese exposed too long to the air during its making is liable to become spotty.

Mr. LeSage.—What is gained by making coloured cheese ?

Mr. Archambault. — Some dealers prefer coloured, others white cheese. I only make white.

Mr. Taché.—Mr. Côté tells me that it is very difficult to always allow three hours to elapse—as the table printed last year recommends—between the time when the whey is drawn off, and the time when the curd is passed through the mill.

Mr. Archambault.—The table ought to state three hours for the spring, and only two for the summer. If it does not, it is a mistake.

Mr. Lussier.—I have taken three hours in summer, and I found it to long.

Mr. Wilson.—I wish to call the attention of the Association to the fact that in this district, as well as over the whole province, cheese-boxes are generally very badly made. When the boxes arrive in that state in the English market, people say at once: "That's Canadian cheese; for the boxes are bad."

The makers ought to refuse boxes that are not fit to stand the voyage. When a buyer is obliged to substitute new boxes for the old ones, it is so much off the price of the cheese.

In one case, I know that out of 144 boxes, 82 had to be replaced at Montreal, and there they cost 16 cents a piece.

Ash and elm are the woods chiefly employed for the boxes. The covers should be made of bass-wood.

Mr. Taché.—I should be glad if Mr. Scott would give us his opinion on the boxes used for packing cheese.

Mr. Scott.—The boxes are better than they used to be but they are not yet perfect. They ought to fit the cheese more closely, and should be shaped for that purpose. Green wood should never be used for cheese-boxes. The wood should be dried before the cheese is packed.

Mr. l'abbé Gérin.—We had a discussion here yesterday, Mr. Scott, on the different sorts of cheese sent into the market: full milk and partially skimmed-milk cheese. As you represent one of the greatest firms (if not the greatest firm) of the province, I should be glad if you would tell the meeting what your opinion, from a commercial point of view, is on the subject of partially skimmed-milk cheese.

Mr. Scott—We never buy skim-cheese; our customers do not ask for it; therefore I can say nothing about it. For my part, I prefer full-milk cheese. I do not think there is much demand for skim-cheese, though I know some buy it, but what they do with it I cannot say. I have bought skim-cheese myself, but the experience was a costly one.

Mr. Taché.—Have you remarked in the coloured Cheddar, of Quebec or Ontario, any tendency to spottiness or variation of colour?

Mr. Scott.—According to my experience this defect is no more common in the Cheddar than in other kinds.

Mr. Lussier.—Perhaps some can suggest means of getting better boxes for cheese. They are usually too large, as Mr. Scott said, and that is a great fault. I know, as a fact, that in order not to have the trouble of turning the cheeses, they, in the factories, put them in the boxes with the big end downwards just as readily as the reverse way. Were it possible to get boxes always adjusted to the size of the cheese, and were care taken to put the cheeses in them with the right side uppermost, the boxes would be less easily broken, and the dealers would be better satisfied.

Mr. Bernatchez.—The way to secure that would be to advise box-makers to make them fit better.

THE MANUFACTURE OF KEEPING BUTTER

REPORT OF THE EXPERTS ON THE SAMPLES SUBMITTED BY MR. CHICOINE.

Mr President and Gentlemen,

I yield to the wishes of our Secretary and a few friends, who have requested me to write something on the mode of making keeping butter. I know that the subject is far beyond my powers and demands a far more competent lecturer than I : but since I have undertaken the duty, I can only beseech you to grant me your pardon beforehand for the discursiveness of this address. To begin with, I must tell you that I have no intention of putting forward my method of butter-making, but as the discussion of every subject illumines it, I will relate the experiments I have made during the present year, and I must say that the verdict of those gentlemen who will have to examine the samples I have brought hither will afford you better means of determining the value of the experiments than any I can offer you.

The samples were made from the 15th to the 19th of June last, with the same cream ; after making, they were packed in glass jars, which have remained closed ever since ; I numbered the jars before filling them, but we took the jars without regard to the numbers ; so that the numbers on them are not consecutive ; but for every jar, when it was filled, we noted the manner in which the butter it contained was made, as you may see for yourselves on hearing the report read after the butter has been examined by the experts.

I will speak, gentlemen, of a fault which is general among butter-makers: they do not take enough care in packing the butter. In Herr Fleischmann's book on the dairy, published in 1884, we read that Herr Busck, a great exporter of Danish butter, packs his butter in tin boxes, hermetically sealed. Butter thus packed, in good order, keeps sound much longer than usual. This year,as an experiment, I filled 50 casks of 100 lbs. each, and sealed them hermetically; I got half a cent more for this butter than for that packed in the ordinary way. Here, gentlemen, is an experiment by which something has been gained. We must keep on making fresh experiments, and not despair if they do not always succeed, but strive continually to produce butter able to cope with all sorts of butter on the foreign market. It is by trying all the different plans, and by reading all the works of those who are at the head of the dairy-countries, that we also shall succeed in making butter worth the the highest price.

ALEXIS CHICOINE.

SAINT-MARC.

Details of butter-making were then given by Mr. Chicoine. We give the report of the experts, who only knew the different samples by the numbers on the jars. See the minutes of the meeting.

15th June 1887, Sample No. 4. butter made with the day's cream, churned four hours after skimming; temp. 55° F.; worked at once, and packed. Classed 5th quality.

16th June. Sample No. 3, yesterday's butter, salted yesterday and reworked to day, packed. 4th quality.

16th. June. Sample No. 5.; cream 24 hours old, kept at 55° F. churned at 55° F.; salted and worked at once; packed. 3rd quality.

17th June. Sample No. 6, same butter as the last sample, salted yesterday, reworked to day, and packed. 4th quality.

17th June. Sample No. 2. cream 48 hours old, kept at 55° F., and churned at 55° F.; salted and worked at once, packed. 2nd quality.

18th June. Sample No. 7., same butter as No. 2, salted yesterday, reworked to day, and packed. 3rd quality.

18th June. Sample No. 8, cream 66 hours old, kept at 55° F. and churned at 56° F, the temperature being colder, salted and reworked as soon as made, and packed. 1st quality.

19th June. Sample No. 1, same butter as yesterday, salted yesterday reworked to day, and packed. 6th quality, pale and vapid.

All these samples were made from cream of the 15th June 1887.

ALEXIS CHICOINE.

REPORT ON THE SAMPLES OF BUTTER.

Mr. Chicoine.—I do not generally work butter twice ; only when it seems to require it.

Mr J. C. Chapais.—I do not know if the experts can give us any idea of the bearing which the acetification of the cream has on the quality of the butter made with cream 66 hours old, and if they are led to conclude that the acetification which the cream must have undergone has tended to this improvement ; for the question is as yet very much disputed.

Mr Taché.—To what do you attribute, Mr Chicoine, the superiority of these latter samples to the previous ones ?

Mr. Chicoine.—I believe it is due to the souring of the cream ; to the fact that the cream has contracted a certain degree of acidity ; not too much, but enough to give it a good flavour.

Mr. Taché.—The cream was always kept at 55° F. in iced water, from the time it was skimmed till it went into the churn ?

Mr. Chicoine.—Yes.

Mr. Langlois.—I am nearly of the same opinion as Mr. Chicoine ; that the souring of the cream gives a higher flavour to the butter. As for working butter a second time, the reason why with *sweet* cream the re-worked butter is better is, because when sweet cream is used, the butter-milk does not separate from the butter in the working ; while, on the contrary, when the cream is sour, the butter-milk is much more easily extracted.

Mr. Taché.—It is remarkable that in the two samples of the last day, we have the best and the worst of all those submitted to the test.

Mr. Langlois.—The reason why the last sample is bad, is because the cream being sour, when the butter was worked the first time all the butter-milk was extracted ; and then, by the second working the butter was spoiled.

Mr. Côté.—Do not you think, Mr. Chicoine, that by taking some other means—putting a little butter-milk into the cream, for instance,—you would cause the souring of the cream in less time ?

Mr. Chicoine.—In that case, I do not think the butter would have so much body, so much consistency.

Mr. Côté.—Have you tried it ?

Mr. Chicoine.—No.

Mr. Côté.—Mr. Chicoine, jr., who worked at Lac St-Jean (St-Prime) for Mr. Fortin, has tried it, and sent me an account of his experiment. From what he says, his butter was not so good as when made with older cream. But he seemed to think that he could succeed in making good

butter by allowing the cream to sour for less time, and then adding butter-milk to it. It would save time and utensils, if the time of souring could be shortened.

Mr. Taché.—I must state that the question raised by Mr. Côté is that which hindered us from doing as much last year for the butter-factory as we did for the cheese-factory. All our inspectors agreed with the cheese-maker of the school-factory at St.-Hyacinthe on the method of cheese-making which should be recommended to be practised by everyone, and we then prepared the table which was sent to all our members. As to butter-making, it was this very question which divided our inspectors. Mr. Barré, whom I consulted on the point, held that instead of keeping the cream a long time on the ice, it ought rather to be cooled very low immediately after skimming, and afterward warmed again to about 60°, so as to make it sour pretty quickly up to the point of being fit for churning.

On the other hand, Mr. Chicoine, who had been making experiments in accordance with his report, and had been perfectly satisfied with the results obtained from letting the cream growcold in iced-water at a temperature of 55 ° F., gave his opinion in a contrary point of view ; and Messrs. Painchaud and Côté appearing to have no definite ideas on the subject, we stopped the preparation of the table of instructions for butter-making. But, it may happen that another year we shall arrive at something determinate on the matter, as to what process we can recommend to be followed by the makers.

(Adressing the experts) : Are all these samples good butter ? What do you think of them ?

Mr. Vaillancourt.—With the exception of one, they are good. The classification made only settles their relative value. That made on the last day which was worked a second time, has no grain ; it is of inferior quality.

The President.—As to the subject we are now discussing, there are some of the Trappist Fathers present, who are excellent farmers, and who carry on a creamery at Lac des deux Montagnes. As these Fathers come from France, they have been connected with European butter-makers, and perhaps they can give us some information on this question.

Le Pere Jean-Baptiste.—In France butter is made in the farmers' houses ; there are hardly any creameries. Every family makes its own butter. During the last few years, however, a few creameries have been started, but very recently. As to ourselves, we take the plans we find, recommended especially those published in the Journal d'Agriculture and in the report of this

Association, Mr. Langlois, who this year bought nearly all our butter, was perfectly satisfied with it.

Mr. Taché.—To condense the reports of the experts on the butter-samples and the conclusions to be drawn from them, we must remark this : The eight samples were made from the same cream, that of June 15th. These eight-were divided into four series, one made the first day, another a day later, and so on, at intervals of one day between each. Of the two samples of butter of each day, one was worked and packed immediately ; the other, after the same working, was kept till the next day and worked over again. Now we saw that the experts, who are evidently good judges, without any knowledge of the way in which each sample had been treated, found the butter good in proportion to the age of the cream and the least working it had undergone. To this there are only two exceptions : the *oldest* sample, that of the last day worked the second time, is the worst of all, while the *youngest* sample worked the second time was the best of its series, though it was not the best of the whole lot. This experiment confirms Mr. Chicoine in his process, though it is clear that there is a definite limit to its practical employment : the first butter of the last day, worked only once, is the best of the eight samples ; the last butter of the same day worked a second time, is, on the contrary, the worst of the entire lot.

Note.—The following remarks were furnished by Mr. Chicoine for this report.

After the verdict of the Judges of the samples of butter I submitted to the meeting, I think it right to give some details of my mode of making butter.

The skimming is done with the centrifuge, and I cool the cream, as fast as possible, down to 50 or 55 degrees, at which temperature I keep it till the next day. From the evening of the second day, I allow it to rise, so as to arrive at 56 or 57 degrees by the time I intend to churn, that is on the following morning, 36 hours after skimming. Though the best sample was made from cream of the fourth day, I would not advise any one to wait so long before churning, unless the cream can be kept at a lower temperature than 55° F.,—which would not be a bad plan for those who can do so. At the above temperature the cream will have acquired sufficient sourness to give the desired flavour to the butter.

Many makers prefer churning the day after skimming ; but to do this they must warm the cream the same evening it is skimmed to allow of its souring sufficiently during the night. In this method, I find two defects :

1. If the temperature of the air should change ever so little during the night, the cream might become either too sour or not sour enough. By the process I follow, the cream can always be controlled at will; for, if it seems to be getting too sour, it can be controlled by cooling it, or by advancing the churning by one day. By these means, one can also insure the same degree of acidity. I wish my cream to have always a slightly acid taste, without having too much of it.

2. The other fault is; that butter made from 24 hours-old cream is more difficult to wash and work. It is often necessary to work it a second time, and I prefer only once working. At no time has butter that I have made with cream of the previous day had the same body, neither would it keep so well in hot weather, and consequently it was of inferior quality. This may be one of the reasons why some dealers prefer butter made from cream gathered in pans, to centrifugal cream.

As for me, I believe that, with trouble and care, as good butter can be made with centrifugal cream, as from the ordinary pan-set cream. Let every maker devote his mind to the business, and there is no fear of our failing.

The whole respectfully submitted,

ALEXIS CHICOINE.

Mr. S. Côté.—I think it would be as well to ask a farmer to tell us how the management of home-made butter is conducted; so I will ask Mr. Couture, of St. Augustin, to tell us how he sets about making good butter.

Mr. Couture.—It is not I who make it; it is my wife.

Mr. Côté.—What sort of cows do you keep?

Mr. Couture.—Canadians, and Canadian-Ayrshires.

Mr. Côté.—Tell us about your dairy.

Mr. Couture.—Up to two or three years ago, our dairy had only one window, and we found that it did not answer its purpose. We have now a window towards the East, and another towards the North, so that the wind, from whatever quarter it may blow, carries off any bad smell that may be produced.

We stir the cream every day, and churn twice a week.

Mr. Côté.—I suppose you keep your milk at 56° F. to 60° F.

Mr. Couture.—Yes, about that. At this season—January—we churn at 64° F., I think, and in Autumn at 60° F. to 62° F.

Mr. Côté.—Have you an ice house?

Mr. Couture.—No.

Mr. Côté.—Do you work your butter once or twice in salting it ?

Mr. Couture. —Only once, at this season, but twice in summer. It is salted, and worked in the evening. We wash it more in summer than in winter.

Mr. Côté.—Do you wash your butter " in grains," or in lumps ?

Mr. Couture.—Not in grains, but in lumps.

FULL-MILK AND SKIM-MILK CHEESE.

In conformity with a resolution passed at the meeting at Three-Rivers, which is quoted in the directors' report, the Association had bought and kept samples of full-milk cheese from the school factory of St-Hyacinthe, and samples of skim-cheese from St. Denis (*mi-gras* ; i. e. *partially skimmed. Trans.*) to be submitted for examination to the experts of the Association. The experts appointed—Messrs. Vaillancourt, Côté, and Fortin sent in to the secretary a report of their examination, which, after having been read to the meeting, was unfortunately lost. But a paper bearing the numbers of the cheeses, as they were submitted to the experts, and the shorthand notes of the reporter of the convention, enable us to reconstruct their report with exactitude. This reconstructed report has been submitted to Mr. J. C. Chapais by the secretary, and is given below. Mr. Chapais found nothing in the notes of the meeting which he took for the Journal d'Agriculture which adds to or subtracts from what follows. The cheeses were taken out of their boxes, and laid out, without order, for the judgment of the experts, only marked by Messrs. Taché and Chapais with a number for reference on each cheese.

Where made.	No.	Month in which made	Classed by Judges.	Remarks of Judges
St.Hyacinthe : Full-Cream.	4	August	Quality 2nd.	" Off Flavour. "
" "	7	"	" 2nd.	
" "	3	September.	" 1st.	
" "	5	"	" 1st.	
" "	6	October	" 1st.	
" "	8	"	" 1st.	
St. Denis en bas : Half-skim	9	August	" 4th.	
" "	11	"	" 4th.	
" "	2	September.	" 3rd.	
" "	10	"	" 3rd.	
" "	1	October	" 2nd.	Fit for exportation
" "	12	"	" 4th.	

A report sent in by the committee on butter coincided with the above statement ; this report was also lost.

J. de L. Taché.

DISCUSSION.

Mr. Chapais.—One result of the experts,report is, that although it has been asserted that our half-skim cheeses are good for nothing after being kept one month, the verdict shows that one of them,although three months old, is good and fit for exportation.

As regards the value of the competition in itself, it is useful to every one, and I will not try to set the examination aside as proving nothing. We were only anxious to have the question cleared up. Still, I must put the meeting in a fit state to judge of the competition.

Last year, when I made the motion in question, our factory at St-Denis was in excellent working order. We made experiments by which

we found that our cheese 4, 5, and 6 months old was excellent. But since that time, we have been the victims of one of those catastrophes of which I spoke in my lecture ; the patrons have seized us by the throat, and a new proprietor has taken possession of the factory, bringing with him a new maker. I give you my word of honour, that if, when I made this motion last winter I had not been in the position I then occupied, I would not have done for St. Denis what I did. For I have always asserted that the very best makers were required for the manufacture of skim-cheese ; it being more difficult to make.

I have nothing to say against the maker this year ; but, if I had known, when I made the motion, that we might possibly lose our then cheese-maker, I should not have put myself so forward.

Mr. Vaillancourt.—Mr. Secretary ; are the numbers 1, 9, 11 and 12, all from the same factory ?

Mr. Chapais.—Yes.

Mr. Vaillancourt.—They have not all been skimmed equally. No. 1, that of October, has only been partially skimmed, or very little.

Mr. Chapais.—Number 1 had 2 lbs. taken. (*i. e., I suppose, per* 100 *lbs. of milk. Trans.*)

Mr. Vaillancourt.—Certainly, the cheese marked No .1 is a good cheese. In the first report we said it was fit for exportation, and naturally, for all sorts are exported. If it had been skimmed, there was very little cream taken off.

Mr. Chapais.—It was I, myself, who selected the cheeses sent, and there were two pounds and a fraction taken from No 1.

Mr. Taché.—This only confirms our opinion that this skim-cheese is apt to deceive the purchaser.

A. Voice.—Two pounds of cream skimmed in October is less than one and a-half pound in July.

Mr. Vaillancourt,—I find a great difference in No.1 and in the Nos. 8, 11, and 12 ; and to tell the whole truth, 8, 11, and 12, are inferior cheese. I consider that, to day, Nos. 8, 11, and 12 would hardly bring 9 cents or 8½ cent. No. 12 would not fetch 9 cents.

Mr. Chapais.—That is the price we were offered for it.

Mr. Vaillancourt.—When it was green ?

Mr. Chapais.—No ; about five weeks ago.

Mr. Vaillancourt.—From a business point of view, I believe that if we had many cheese-factories that practised skimming, as they do at the St-

Denis factory, it would be a misfortune for Canada. There is no doubt about our cheese enjoying a very high reputation on the English market, even higher than the cheese of the States, but that is chiefly due to the province of Ontario. For, in the province of Quebec, we have certainly many good factories, but there are also many which might bear to be improved. We have very few good factories that skim the milk before making cheese, and few as they are, they are more than enough.

It is true that these factories sell their cheese ; but that is owing to commercial greed, which urges us, the dealers, to buy cheese to sell again at a profit. One always hopes for " better luck next time " ; but, out of ten lots of skim-cheese bought, it is seldom that five of them are not sold at a loss. If we do not lose, it is the man who buys from us, or the third hand who buys of the second.

I am not well inclined towards the skimming factories. I am well acquainted with the general feeling of business-men, and you will rarely find a dealer who is in favour of factories which skim their milk.

For there is no regularity in the way in which they skim. They take off more in one month than in another. For instance, last August, I bought a skim-cheese of excellent quality , and yet the September cheese I bought, from the same factory, was very ordinary stuff.

Mr. l'abbé Gérin.—Is the partially skim-cheese that you buy consumed here or exported ?

Mr. Vaillancourt.—Very little of it is consumed here ; it is exported.

Mr. Gérin.—Under what name is it exported ? Is it sent abroad as full-milk cheese, or under any particular brand ?

Mr. Vaillancourt.—I am not going to betray the secrets of trade. I export very little of it myself, if I did I should be afraid of being found fault with.

But those who have exported it on a large scale have always told me; " It is with cheese made from even partially skimmed milk that we are the most in danger of losing money."

Mr. Langlois.—I do not export much, but my impression is that it is sent abroad as full-milk cheese.

Mr. Chapais.—Now the competition is concluded, and our cheese is determined to be very defective, it seems to me that if the dealers would agree to buy no more skim-cheese, its manufacture would be given up. What was it induced us to start making it ? It was that when we began, we found we could get much larger profits than from making only full-milk cheese.

For seven years, this question has been under discussion. A great number of Montreal merchants have written to Mr. Taché to denounce this cheese. Still, they keep on buying it, and now they come and tell us that " we buy it in spite of ourselves " ! Let them stop buying, and we will stop making.

As to the question about the English market, I will submit to you a document of the greatest importance. It seems to be asserted here that partial skimming is never practised for Cheddar cheese. Now, here is a letter from a great English proprietor, whose tenants make Cheddar cheese.

Translation : " At the begining of the season, say, in May, June, and " July, they do not skim, because the cream, though plentifull is thin. " But in September and October, at which time the cream though much " richer is less abundant, we are in the habit and we think it the better " plan, of taking half the cream of the night's milk, and not returning it " into the cheese. The cheese is then, if not quite, almost as good as un- " skimmed cheese : the curd is better ; the flavour is higher according to " some ; the idea being that when there is too much *condition* in the cheese, " the flavour is not so full. The less condition, the more flavour. As to " the effect of taking a pound and a half of butter from 100lbs of milk, " our people know nothing about such weights : they do not weigh but " measure the milk.

As to the price of the two kinds, I cannot find that there is any difference between them. As a rule, provided that what I said above about the season if the year be observed, the two kinds seem to be equally good.

And again : " I think you can trust to what I have told you, for my tenant at Nutdown, from whom I get the information I send you, has been very successful at an exhibition of cheese at both the County and the Royal Agricultural Exhibitions, when he showed his skim cheese.

So it appears clearly established that in England it is thought wise to skim, at least during September and October ; which proves that it was going rather too far to say that partial skimming was never practised at all.

We observed before : If our skims are saleable on the English market and if we get more profit from them, why should not those who like to run the risk make them.

If the English market will not take them, the question is settled ; but we should know how the matter stands. If the Canadian dealers agree

among themselves not to buy skims, it would be all over with them. But I do not think that will ever happen.

Mr. Gérin.—I want to say one word on this subject. I ought to know something about it, for in my parish there are two factories which work after Mr. Chapais' plan, that is they make butter and cheese from the same milk.

As regards the interests of both factories, then can be no doubt as to the results : the combined plan pays the makers better at present. But, with regard to the interest of the public, it is not the same.

I was glad to hear the half-confession of Mr. Vaillancourt. It is a secret we never have been able to drag out of the dealers until now ; but think we have get it, or at least half of it. It has been stated that partially skimmed cheese is good cheese ; but we cannot be persuaded that by taking two pounds of cream from the 100 lbs. of milk the cheese is not impoverished ! Being less rich, the cheese is worth less. And on this cheese, when it arrives in the market, trade lays its hands ; 100 pounds of skims are slipped in among 500 pounds of full-milk cheese, and the whole is exported in one lot. This I cannot regard as anything but a robbery !

The patron, for his part, may skim his milk, and say: " It is good milk; skimmed, but good. " Still, you must admit that this patron deprived the others of some of their profits.

In the sale of cheese, it is just the same ; the price of the full-milk cheese is depreciated, on account of the skims that are slipped in with it. Through the general diminution in price which the skims cause on the market, the man who makes only full-milk cheese loses ½ a cent or a ¼ cent a pound on his cheese. It is the same thing as when you are selling or buying a lot of sheep ; the big ones lose their value on account of the small ones that are slipped into the flock.

The future of our dairy-business is in danger. If to-day, our cheese is appreciated in England, it is because it began to be valued in the early time of the dairy-movement, in the time of the competition with the United-States where they used to make skim-cheese, But I fear that if we continue to delude the public, our cheese will be depreciated on the English market, and England will say to us : " You are deceiving us ; we shall now deal elsewhere." We shall then lose a resource without which our farmers cannot get on.

I am glad to have this opportunity of expressing my idea ; and I would beg all men of influence to draw the attention of government to this matter. If, as people assert, the skim-cheese is good, and will fetch a good price on the English market, well ! let it be branded.

Mr. Chapais.—Certainly ; let it be branded, by all means. It is the fault of the buyers if skims pass as full-milk cheese on the English market.

Mr. Vaillancourt.—The English are good judges of cheese ; and three quarters and a half of the time ($\frac{7}{8}$? *Trans.*), it passes for skim-cheese.

Mr. Gérin.—I do not see how the English can buy it for skims !

Mr. Vaillancourt.—Skims are generally quoted and sold as skims, and they are even quoted according to their degree of skimming

Mr. Gérin.—At all events, it is in connection with your first avowal that I made the foregoing remarks.

Mr. Taché.—M. Vaillancourt certainly made this statement : that if it is not the first purchaser that is duped, it is the second, or the third, the cheese passing through several hands before it reaches the consumer.

Mr. Bernatchez.—Would Mr. Gendron give us his experience in the matter ?

Mr. Gendron.—I have sent to Mr. Taché the result of the trials I have made.

Mr. Taché.—Mr. Gendron is the proprietor of two factories, in one of which is made full-milk, and in the other partially skimmed-milk, cheese ; he can relate, himself, the results obtained from each place.

Mr. Gendron.—I have two contiguous parishes (*factories ? Trans.*) and after comparing the accounts of both, we found that the full milk factory gave nearly $\frac{1}{4}$ cent par 100 lb. of milk more than the skim-factory.

Mr. Chapais.—I have results the very opposite of these.

Mr. Taché.—The two results produced by Mr. Gendron have been made under his own management.

Mr. Ayotte.—Louiseville sold its full-milk cheese for 10 cents, in October ; and Maskinongé, its skims at 11 cts

Mr. Vaillancourt.—That was, because Louiseville must have sold at a different date to Maskinongé, and the markets must have been very low at the time.

Mr. Taché.— It is not reasonable to suppose, all other things being equal, that cheese from which a portion of the cream has been taken, should be considered as good, and sell as high as full-milk cheese.

Mr. Ayotte.—I have always been opposed to the combined system ; but this year, driven to it by competition, I have been forced to make an outlay of $600, to fit up my place for making butter and cheese.

(Mr. Taché continued to read the notes of Mr. Gendron.) See, a little further on an extract from Mr. Chicoine's notes, with reference to an experiment made at Mr. Gendron's.

Mr. Taché.—Just now, Mr. Gendron affirmed that his two factories gave the following results; the full-milk cheese factory gave ¼ of a cent per 100lbs. of milk more than the skim-milk one. The difference is trifling; but it was expected that the skim-factory would do much better, so that there is all the difference in the world. The patrons ought never to press their own interests to the expense of the factory-proprietor. Mr. Gendron must have laid out $1,000 or more in arranging his factory as a skim cheese and butter one.

Mr. Chapais.—Mr. Gendron will admit, I believe, that he skims very slightly especially, at the beginning of the season. At our place, we skim all the time. We have the returns for seven years; and on an average we have paid the patrons from 85 to 88 cents. These results I have had the opportunity of comparing with those of the neighbouring factories which do not follow the combined system.

Mr. Bernatchez.—The results obtained by Mr. Chapais are not of a nature to convince us: they are not experiments made the same day, in the same factory, and with the same milk. The difference between the richness of different milks might affect the results. At home, I have sold the cheese from the St. Thomas factory and from the Berthier factory; and I have sold cheese made by the same man and on the same principle, with a difference of 5 cents per 100 lbs. of milk.

Mr. Archambault.—This autumn, I conceived the idea of making butter and cheese from the milk of my own cows only. I keep about 40 cows. Before beginning, I wished to find out the difference of profit between the combined process and making full-milk-cheese.

I began by making skim and full-milk-cheese on alternate mornings during several days, to see which would pay me the better. Here are the results:

Full-milk-cheese.—It took 7 ℔s of milk to make 1 ℔ of cheese (weighed green); 600 ℔s of milk, then, gave me 85 ℔s of cheese.

Skim-cheese.—It took 9 ℔s of milk to make 1 ℔ of cheese (weighed green); 600 ℔s of milk, then, gave me 66 ℔s of cheese.—In addition, I made 6 ℔s of butter.

I put the two qualities of cheese at the same price: 12 cents.

The full-milk-cheese gave.....	$10.20	
The skim-cheese gave.....	7.92	$9.42
6 ℔s of butter at 25 cents.....	1.50	

The skims and the butter gave me together $9.42! and as the full-milk-cheese gave me $10.20, I found myself losing by making butter and cheese, 78 cents on 600 ℔s of milk.

I then gave up the combined system ; my interest warning me not to continue it. I defy any one to throw a doubt upon the results of this experiment, which, if you desire it, I am ready to repeat.

L'abbé Chartier.—To be very accurate, Mr. Archambault has had the butter-milk analyzed. If you please, I will read the analysis made by our chemist.

Of butter there remained 4 o/o in the butter-milk ; 7 o/o of casein and albumen.

The conclusion he draws then, is, that while. in summer, butter-milk contains from 6 o/o to 7 o/o of matters fit for cheese-making, autumn and winter butter milk contain 11 o/o of them. In winter, then, 10 ℔s of butter-milk are equivalent to one pound of cheese. Now, Mr. Archambault has proved that he had 10 ℔s of butter-milk. equivalent to this one pound of cheese : 12 cents. So that, even if he reckoned this pound of cheese, the difference in favour of the full-milk-cheese would be 66 cents on 600 ℔s of milk.

This is a solitary experiment, but Mr. Archambault is thoroughly used to conduct this sort of experiment.

Mr. Chapais.—But the experiment was only carried on for a few days; it would be better to take the result of a whole season.

Mr. Chartier.—Cannot the results of the St. Denis factory be explained by the at skill of the men who managed it ?

Mr. Chapais.—That is possibly the case.

Mr. Chartier.—Beside the parish of St Denis is celebrated for its pastures ; hence, the cows there give a richer milk. So that there are a crowd of reasons why the factory there cannot be quoted as an example.

Mr. Chapais.—But you have other factories which may find themselves in the same situation : Mr. Ayotte's, and Mr. Gérin's factories !

Mr. Chartier.—At any rate, Mr Vaillancourt has made a suggestion which interests us very much and which we ought to consider seriously, without trou bling ourselves about its possibly injuring any one who has set up a combined factory.

It is this : even if there were only one dealer who would dare to mix skim-cheese, in small quantities with large lots of cheese sent to market in town, the danger to our business would be real. With a thousand good cheeses, if you pass off five bad ones, that would be sufficient to earn you, a bad name. We were well aware, before Mr. Vaillancourt's confession, that dealers, through greed, were in the habit of buying skims at even exhorbitant prices, but always a little cheaper than the other. They do

another thing ; there are dealers who pay a little over market price for a lot of first-rate cheese, in the hopes of passing off with it a certain number of skims.

Mr. Chapais is reasonable enough to admit that the results he speaks of as being shown at St. Denis are not realized elsewhere. And even if a few extra dollars could be gained by making skims is it to our interest, is it to the interest of the nation, to appear on the foreign market with second class goods ? You know perfectly well, that if your cheese is sold honestly if it is old enough to be tested, it will only pass as number 2. Would it be to our national advantage to be always quoted in the price list of the foreign market, as No 2 ? Even supposing you make the best skims only, they will never be anything but No 2 by the side of full-milk-cheese.

It seems to me that hoping as we do to gain the highest reputation on the English market we ought to give up making cheese on the combined system, even at the sacrifice of some possible extra profits.

Let us make cheese ; but let us make it of the best quality.

Mr. Taché.—There will be an opportunity of determining the comparative value of cheese : I will this evening lay before the meeting samples of the cheese made at Mr. Archambault's and by the St Denis factory which were examined to-day, and you will then be able to judge which of the two is the more likely to enhance the reputation of the country.

Mr. Bernatchez.—I wish to make a suggestion to this Association. I think the time has arrived to find means of distinguishing the skim cheese by some mark, in order that, when it comes on the foreign market it may not deceive the purchaser. Mr. Ayotte was forced, by the competition of his neighbours, to make on the combined system, though he condemns the principle. Well ! Since people persist in carrying on this system, means must be found to get the federal parliament to pass a law compelling the inspection of cheese, and marking this cheese with a stamp as : Skim-cheese. I hope the Dairymen's Association will take the initiative, that resolutions to that effect will be passed by the board of directors, and that we shall do our best to effect the passing of such a law.

Mr. Chartier.—Now that the dealers confess that they try to pass of skims as full-milk cheese the opportuneness of taking such a course is still more evident.

(What follows was in the lecture of Mr. A. Chicoine, and has been inserted here to carry out the subject. The experiment reported was made at Mr. Frs. Gendron's, Ste Anne de la Pocatière, already mentioned in this report.)

Mr. Chicoine.—I cannot allow this little conversation to come to a conclusion without speaking to you about full-milk and skim-cheese.

Several people assert that skims give more money to the patrons than full-milk-cheese, and I confess that, formerly, I was of that opinion myself; but in the autumn of 1886, I made the two sorts at my place, and I found that I lost money by skimming the milk, and this summer I tried another experiment, the result of which was as follows :

The experiment was carried out on sept. 10th, in the same factory, and with the same day's milk.

4424 ℔s of milk were skimmed, from which were made 20 ℔s of butter, and 500 ℔s of cheese—weighed from the press.

4113 ℔s of full-milk made 463 ℔s of cheese—weighed from the press and 40 days afterwards both butter and cheese were sold.

Full-milk-cheese—441 ℔s, at 10½ cts	$46.30
Skim-cheese only weighed 421, at 10 cts	42.10
20 ℔s of butter, at 20 cts	4.00
	$46.10

The skim-cheese lost 79 ℔s, while the full-milk-cheese only lost 22 ℔s ; the latter paid the patrons $1.12½, the skim-cheese only $1.04¼, i. e. 8¼ cts. less than the full-milk-cheese. It is very certain that if they had been sold at the end of two or three weeks, there would have been a still greater difference between them, for the skims would have lost more weight, in proportion, than the other.

I explain the matter thus : to make 20 ℔s. of butter, not less than 60 ℔s. of cream must have been taken, and this weight of cream would have added not less than 50 ℔s to the cheese ; that is my explanation of the difference between the two sorts of cheese. If we had an experimental school-factory, it would be easy enough to have more scientific explanations, but since we have none, we must still remain in a state of uncertainty espacially as far as I am concerned.

NOTES ON CHEESE-MAKING.

Mr. President and Gentlemen,

In presenting myself before you for the purpose of giving an account of the observations I made during last summer. I feel almost condemned in advance to fulfil the task of repeating not only what has been said during this interesting meeting, but also during the preceding winters, ever since the establishment of your excellent association.

Have you not, in fact, heard every year your inspectors read in turn the reports of their tours ; relate to you the ideas which the experience they had gained suggested to them ; and, lastly, invite you to adopt the most approved modes of manufacture, after having explained them and shown you all their advantages !

And have you not also, gentlemen, enjoyed the advantage of seeing, in your midst, at St Hyacinthe or elsewhere, men thoroughly skilled in the practical business of agriculture, consummate *savants* who, grown old in study, have made agricultural matters the object of researches and investigations during the continuous labour of a whole life

What then remains to be said and to be done by those who, like me, cannot speak from experience, for the simple reason, that they have not had much.

The question is a very difficult one ; and I tell you frankly, gentlemen that I hesitated for a considerable time before, finding even a weak reply to it. But, after reflecting a little, it struck me that as all science is in itself progressive, the dairy-industry could not be an exception to the rule ; that, on the other hand, to repeat were it to only one new hearer, observations and facts which might be put to use by him, might help him to overcome obstacles heretofore insurmountable by him, and might tend towards his prosperity, was not so ungrateful a task as I had taken it to be at first sight.

Far better than that, gentlemen.—and observe the inconstancy of human thought — I am now very proud of the honour the secretary did me when he asked me to address this meeting, and it is you, gentlemen, whom I pity with all my heart, since you through your kind feelings, are condemned to hear me to the end without a frown.

Before speaking of the manufacture, properly so called, it is generally customary to devote a few moments to the subject of milk, of the care to be given to it, and to the adulteration it is subject to at the hands of dishonest patrons. Cheese-makers know on what to rely on these points, and if some still have doubts as to the value of the rapid analyses to which

they ought to submit every lot of milk they receive, a few hours of practical work will be infinitely more useful to them than any amount of talk.

There is, though, a point on which I feel justified in pausing a little, not because its importance escapes the observation of some, but also on account of the ease with which a lazy cheese-maker can injure the interests of a certain number of his patrons : I speak of the weighing of the milk.

You are aware, gentlemen, that it is not the custom to take into account any fractions of a pound, and there is nothing blameable in it, as the patrons know beforehand what the engagement is to which they bind themselves. But the question bears another face, when the weighing machine is so arranged as to subtract several pounds from each separate weighing. The maker is then to be blamed, for he is committing a flagrant injustice. Were all the patrons to bring every morning exactly the same weight of milk, it is very clear that even if 20 o/o or 25 o/o were deducted from their weights, the result would be all the same to them : they would get a higher price for 100 lbs, of milk, and that would be all. But this is never the case. At every factory, there are some patrons who are rich and others who are poor ; some who bring 10 lbs. of milk, some 100 lbs., and some who perhaps bring 1,000 lbs. Now, suppose for a moment that your scales are so arranged that they weigh short each time by 4 lbs., then, using the figures cited, the first of the above mentioned patrons will lose 2/5 of his milk, the second, 1/25, and the third, 1/250. Whence it follows that it is always the farmers who keep the fewest cattle, those who in the present state of agriculture must be considered as the least prosperous, who lose the most, and see their money pass into the pockets of others who receive it without any suspicion, for the cheese–maker is the responsible, the only guilty one. But, it will be said, if this fraud, for it is nothing less, does not enrich the maker, what can be his interest in giving incorrect weights ? He is simply guided by a desire to please his patrons, and to make himself a good reputation as a cheese maker ; for of course it is easily understood that, by cutting down the sum of each weighing, the total weight of milk received will be sensibly diminished, and consequently, the yield of cheese per 100 lbs. of milk increased in a very appreciable proportion.

It is our duty I conceive, gentlemen, to oppose all our power to such an abuse. We often meet with cheese-makers, whose reputation is yet to be made, who impose upon the credulity of farmers by promising to make a great deal out of very scanty materials, and I trust that those conscientious makers who reckon only on their skill to raise them to a favourable position, will view with good will my endeavours to show that

the real origin of those yields, which are regarded us phenomenal, lies in nothing else but the way in which the milk is weighed on its reception into the factory.

It is possible that many makers do not think a great deal about the wrong they do in behaving in this way ; and this is another reason for enlightening them, and for making them understand that there are other means of arriving at the height of reputation than making themselves the dispensers of the interests which others have entrusted to their care.

The addition of the rennet should be made at the temperature marked in the tables printed and distributed last season. Mr. Macdonald, the skillful maker at the school factory, in offering to whom my thanks for all the knowledge I have of the business I take pleasure, tried to add the rennet at a higher temperature, even up to 98 ° F. We found no great difference ; still I would not recommmend, in general, such treatment ; the curd, after the three cuttings, *masses* too easily, the stirring must be more vigorous, and I should not be astonished were the yield to be slightly affected.

One of the most important operations, in my opinion, is the heating. To know how to raise the heat properly, is not learnt at the first lesson. The vat in which one is at work and the steam pipes that enter it, must be thoroughly understood. Many results spring from bad heating up : either a bad curd is produced by heating above 98 ° a temperature which (should never, on any pretext, be exceeded), or the yield may be considerably diminished by an injudicious stirring. It is to the latter point that the attention of all interested in the matter should be directed. At the school-factory, during the absence of Mr. Macdonald on his tour, I was left in charge. We had always been accustomed to weigh, very carefully, the cheeses when taken out of the hoops, and to calculate, at once, the yield per 100 lbs. of milk. I must confess that, at the very beginning, my yields were invariably a trifle less than the yields of the chief. Not being able to find out the reason, I asked him to explain it to me : the sole difference lay in my way of heating up. and I saw it clearly enough afterwards ; for by stirring less forcibly and with greater regularity, and by turning on the steam very gently at first, my yields were greatly improved, and became equal to those of Mr. Macdonald.

Immediately after the heating up is finished, the curd should always be tried with the hot iron. It is not wise to wait, trusting to the smell or taste of the whey, expecially in summer, since in a few minutes decisive changes may occur and the whey from sweet become sour.

I shall not pause long on the threads which should be produced before the whey is drawn off. As this conference is intended for cheese-

makers, I refer them on this point to the very complete table I spoke of just now, contenting myself with expatiating on subjects a knowledge of which may be useful to all.

Suppose, now, that the vat has been sloped, the whey pretty nearly run off, and that the curd is gathered together at the higher end of the vat. Now is the time for the maker to show that he does not mind trouble and that, if necessary, he knows how to " stir his stumps. " The stirrings must be repeated with sufficient frequency to prevent the little pieces of cheese from clinging together ; else, it would be necessary to break them, and a good part of the constituents of the curd would drain into the whey increasing its richness at the expense of the curd. It is impossible to fix the necessary number of stirrings ; it depends on the condition of the curd. Mr McPherson advises us to try it with the teeth, and asserts that it is sufficiently hard when it is resilient and creaks, like india-rubber. In every case, it must be well understood that the stirrings should be given rapidly, before all the whey has run off, to prevent the curd from collecting into big lumps. Neither must it be forgotten, that if the curd is not hard enough at that moment, it can never be got hard again, it will remain just as it is, and will be found to be the same in the finished cheese, with all its good qualities and all its defects.

The grinding in the mill is done, according to the season and the state of the curd, at the end of 2 hours, 2½ hours, or 3 hours. One grinding ought to be enough. In grinding twice or thrice, a great risk is run of losing in the yield and in the mellowness is of the cheese. I am well aware that this used to be the treatment pursued formerly with a view to getting rid of the tiny holes that, in summer, perforate the cheese by thousands. Nowadays, after earnest investigation, it is found to be better to let the whey become a little acid, to grind at the end of two hours, and not to apply the salt until, as the result of frequent stirrings, all the holes in question are closed, or are on the point of closing.

Should cheese be left 24 or 48 hours in the moulds ? From my observations last year, I am led to think that there is nothing gained by waiting two days before the cheeses are placed in the ripening-room. All the advantages of the press appear to me to depend upon the two or three first hours after the cheeses are put into the moulds. When preparing for the Provincial Exhibition at Quebec, last year, we made two lots intending to select the better for the competition ; one remained two days under press, the other only one. The representatives of the great Montreal firms at St. Hyacinthe were good enough to come and give us their opinion. Every one,

without exception, pronounced in favour of the second lot, and, strange to say, they declared that, in their opinion, it was closer and more consistent than the former, which had been two days under press. This I willingly admit, is not a very conclusive proof, but I am satisfied that by pressing often, regularly, and by degrees, during two or three hours; by tightening the bandages at the end of the first half-hour, or the first hour at furthest, and by pouring hot water on to the top of the cheese, an excellent result will follow.

I should be sorry to end what I am saying about cheese, without referring to the work of saturday evening. Every one knows how many complaints are made by the dealers about the small vats of cheese made in the evening of that day with the milk of a single milking. The following is the procedure we adopted this year at the school-factory, and I can say with perfect truth that we had no fault found with the results We put ice into the vat that the milk might be cooled immediately after its arrival, and continued to work as usual until the drawing off of the whey; as soon as that was run off, and the curd was sufficiently stirred, we gathered it into one corner of the vat; if the weather was cold or the factory imperfectly closed, pails of boiling water were placed round the heap of curd, and it was then left to itself till the next morning, four or five hours. It was then passed through the curd-mill, and, in a word, the rest of the process was carried on as usual during the week day workings.

In this way, the maker runs no risk of falling asleep, while waiting for the acetifying of his curd, and of waking to find his curd giving threads two inches long when applied to the hot iron.

And now it only remains for me to say a few words about the accounts to be kept at a factory. Often, too often, this word, accounts, only applies to a scrap of paper; on which are inscribed all the entries of each patron. Nothing, perhaps, is more to be regretted; a factory is only set going because certain farmers, in sufficient numbers, unite to supply it with the raw material; thus it is a species of association, and as copartners, each of the members has a right to inspect as closely as he chooses the affairs of the firm. It is not sufficient that the daily entries be made with precision; the yields of each day must be set down. I could mention cheese-factories, which, on making a sale, are content to send to their patrons a small slip of paper, bearing the amount due to them, and nothing more; nothing about the milk furnished; nothing about the price of the goods sold: in a word, nothing that might enable them to verify the accounts. It is owing

to this that distrust and cavils insinuate themselves among men whose interests are identical. Why should not things be done well, when it is to the advantage of every one that they should be done well. Why, for the sake of saving a few cents, should suspicion be allowed to creep into the most upright and best disposed minds, to induce them to think things that, very likely, have no existence ; for you know, gentlemen, that doubt is very near the borders of suspicion.

At the school-factory, we made this summer for the first time, of the "Ledger book for cheese factories" of which Mr. Taché, the Secretary of the Association, is the compiler. It gave us entire satisfaction. On some leaves, bound together, are to be found, in a condensed form, all the operations, sales, and entries made during one season. Each patron can understand the whole in a few minutes, and can verify at his leisure all the figures contained in the note sent to him after each sale.

I will not go so far as to say that no complaints were ever made ; but at least we had the means of seeing whether these complaints were just or unfounded.

I have now, Gentlemen, arrived at the end of the task imposed upon me. You will, I am sure, pardon the tediousness which is inevitable when such a subject is being treated. I have been tedious, no doubt, but I had a great deal to say.

The province of Quebec, to which I am sincerely attached, will never attain to prosperity except by means of the dairy-industry. You must all work without ceasing ; you must hunt up all the movements made abroad follow up and try to apply all the discoveries that are made so as never to be behind hand : and, above all things, I hope you will invariably display as much good nature as you have to-day, when you shall be compelled to listen to, I am sure I hope you never will be—such a dry lecture as this of mine.

M. FREY,
Graduate of Grand-Jouan.

BUTTER-MAKING

FATHER JEAN-BAPTISTE

Mr. President and gentlemen,

I by no means expected to be asked to speak in public, and I have made no great preparation for it.

In this evening's session, however, a question was treated which, I believe, is interesting to everybody, and to ourselves as well, the method of making butter. The experiments which Mr. Chicoine has made, will I think serve the purpose of assisting the progress of the question. I asked him, privately, how he skimmed, at what degree of thickness he took the cream; if he sought to take any milk with the cream, a practice which, I believe, is followed in many creameries; or if he took off the cream with as little milk as possible. As to the last question, he told me that in skimming, he took as little milk as possible.

I can tell you in a few words what we have done at our place. This is the second year that our centrifugal creamery has been at work, and we have always been satisfied with the results.

Last year, we tried to skim without taking any milk at all with the cream, and if any little quantity did come over, it was purely, by accident. We churned when the cream was 24 hours old.

Messrs. Vaillancourt and Langlois, who saw our creamery last year, as well as this year, made several remarks to us, and one of those particularly that were made to-night: they advised us to let the cream become staler, that it might sour a little, and thereby develop a higher flavour in the butter. Mr. Langlois told me in so many words that our butter was perhaps a little wanting in quality on that account; for otherwise, it is very good.

This is the way in which we conduct the skimming:

We fitted up our creamery chiefly for our own use, to utilize our land and our cows. We placed ourselves, as much as possible, in a state independent entirely of the farmers; not as regards doing them any service, but in order to avoid being under any obligation to them or the reverse. So that, on both sides, we, the farmers and ourselves, are perfectly independent. We can receive them and dismiss them as we please.

Last year, we skimmed without making any distinction between him who brought good, and him who brought bad milk; and we paid

everybody the same price and on the same average of quantity. In consequence, those who had good, rich milk, lost by it, and those who had poor milk gained.

This year, we began in the same way. Towards the month of july, we fancied we saw (I am sure I do not know how it happened) that there were some farmers whose milk was excessively poor, so poor that some of the cream must have been abstracted. We then began to make experiments more frequently, twice, thrice, and four times a week, and in this way, not in an absolutely exact manner, but in a sufficiently correct fashion, we ascertained how much cream each patron brought, and in the division we afterwards made, we tried as much as possible to give every one his due. For instance ; if it required 25 ℔s. of a certain patron's milk to make a pound of butter, when the average was 22 ℔s., that patron was only paid for 4 ℔s. of butter per 100 ℔s. of milk.

The patrons were all delighted with the results thus obtained. Just at that very moment, we had one patron of whom I had my doubts. We observed on the cover, and even on the bottom of his can, crumbs of bread ! One day, the Brother whose duty it was to weigh and receive the milk said to the little boy who used to bring the milk : " My boy, you have taken some cream; there are bread crumbs on your can. " No, it is our own." Another patron who happened to be there said : " Ah ! you're a thief ! " The boy replied : " But the creams is ours : I am not robbing any body " " Then," said the Brother, " you did take some cream ?" He answered : " Well, I did. " The boy's father brought the milk himself the next day, and the Brother continued his experiments. But we nevermore saw that farmer at the creamery. Still, he talks of returning next year.

We, then, made up our minds to pay each patron according to the quality of his milk. Our mode of analysis is not perhaps a very practical one : we use the ordinary test-tubes. We went so far, however, as to skim each patron's milk separately. to ascertain exactly the number of pounds of such or such an one's milk required to make a pound of butter.

Should any one present have a more practical means of detection. I should be very glad to know it, and I believe that an immense deal of good would be done by it, for, with such a system, people would not dare to bring fraudulent milk to the factory ; for to do this is to throw away one's trouble. A man once asked me : " If I put water into my milk, should you find out ? " I replied : " Yes ". " And if I took some cream from it. " Certainly I should know it and besides I do not trouble myself about it. When your milk is compared with your neighbours milk, you will

receive more or less money in proportion to the richness or poorness of your milk. If you add water, you are only giving yourself the trouble of carrying that additional weight to the factory for nothing ; if you skim off some of the cream, you will have so much less money to come to you. You will be paid for the cream you bring." They were all delighted with this manner of treating them.

Our cream is so thick that we are obliged to dilute it with some of the skim-milk of the same day ; this raises it to the required temperature. In summer, on the average, it takes us ten, fifteen, or at most, twenty minutes to bring the butter.

Mr. Dion, who has seen both our system and our churn, knows that the churn is of very moderate dimensions : two feet broad, two feet high, and rather more than three feet long. It is nothing by the side of other churns, and yet, this year, we have made in it as much as 220lbs. of butter at a churning. We put a very small quantity of milk into the churn.

I do not know if this plan is better than another. In a majority of the creameries we were told, on the contrary, that they mixed a good deal of milk with the cream—perhaps to sour it more quickly—and it churned more easily. But, I think the result would be that the butter would be longer in coming.

I should be very glad to hear any explanations that Mr. Chicoine or others might be pleased to give on this subject. I simply relate the way in which we manage affairs at our creamery.

A Voice.—How much milk does it take with you to make a pound of butter ?

Father Jean-Baptiste.—Last year, from april 21st to november 15th, when no more milk was brought to the creamery, average was 21¼ lbs. The highest figure was from 21st april to 4th or 5th may : 27½ lbs. A second time in may, below 24 lbs. At the end of october and at the beginning of november, 18 1/10lbs.

Mr. Fortin.—Taking the cream off in such thick state, do you not leave some of it in the milk ?

Father Jean-Baptiste.—Never ; unless by chance. I have often asked the patrons if, after the skim-milk got home again, they ever found any cream rise. They all told me that they never, or hardly ever, perceived any, and what they had seen was so trifling in quantity that it was not worth talking about.

A Voice.—How often do you skim a day ?

Father Jean-Baptiste.—Only once.

A Voice.—What separator do you use ?

Father Jean-Baptiste.—Laval's No. 1.

A Voice.—At what pace is it worked ?

Father Jean-Baptiste.—I have not showed this year, but I think about 7,000 to 8,000 revolutions.

Mr. Chapdelaine.—How do you salt your butter ?

Father Jean-Baptiste.—With dry salt.

Mr. Chapdelaine —How much to the pound of butter ?

Father Jean-Baptiste —It varies with the season. We have put as much as 1½ lbs. to 70 lbs. of butter. At certain seasons we put more.

Mr. Chapais.–I understand Father Jean-Baptiste to say, when speaking of churning that at times he made butter come in so short a time as fifteen minutes ; where as the inspectors generally assert that churning should take at least twenty minutes, and, may be forty-five minutes. Can these two opinions be reconciled ? Can churning really be done properly in less than in twenty minutes ? All the writers on the subject assert that churning ought to take at least twenty minutes.

Mr. Côté.—The time depends on the quality of the cream, which according to the Reverend Father, is in this case very thick.

Mr. Chapais.--We must then draw the conclusion, from what has been said, that there are cases in which churning can be done in less than twenty minutes.

Mr. Painchaud.—It may depend, too, on the speed at which the churn is driven.

ON THE QUALIFICATION FOR THEIR SEVERAL POSITIONS, AND THE RELATIONS THAT SHOULD SUBSIST BETWEEN THE PROPRIETORS, THE MAKER, PATRONS, AND MANAGERS OF BUTTER AND CHEESE FACTORIES

LECTURE BY MR. J. C. CHAPAIS.

Mr President and Gentlemen.

Every species of trade includes factors the united influence and action of which give life to its action. If this action and this influence are exercised in accordance with the principles which govern the trade in question, it will prosper. On the contrary, if the manager wander more or less from these principles in their working, the trade will cease to be prosperous, it will become precarious, and frequently its end will be ruin. This is true of every trade, but more especially do I think it true of the dairy-trade, the subject that more particularly concerns the present meeting. The chief factors whose action and influence affect the dairy-trade are : first, the proprietor of the factory to which the milk is brought, and where it is converted into saleable goods ; secondly, the *maker* who converts the milk into these goods ; thirdly, the patrons who furnish the basis of the trade, and in the fourth place, the manager who disposes of the manufactured goods. There are certain principles laid down nowadays for the government of the relations which must exist between these different factors of the dairy-trade, and against these principles no one can sin without inflicting injury on the progress of the trade itself, and on those who gain their subsistence by it.

I am here to-day Mr. President and gentlemen, for the purpose of studying with you the principles which govern the dairy-trade, as regards the manufacture of its products by an association (in common) or wholesale by a single proprietor ; to inquire what should be the qualifications of those who, under whatever title, practise the art ; and to show what should be the relations that must necessarily exist between the proprietors, the makers, the patrons, and the managers of butter and cheese-factories.

To begin with, I will touch upon the qualifications which he should possess who intends to become the proprietor of a factory, and upon the nature of the relations between him and the man engaged as maker of the goods, with the patrons who furnish the milk and with the tradesmen with whom he must necessarily deal.

But, before talking of what are, or ought to be, the present qualifications of the proprietor of a factory, it would be well, I think to cast an eye over the origin of the system by which the milk of several farms is collected in one place, for the purpose of being converted into butter or cheese for the benefit of its associated proprietors. This will help us to understand better the principles which must govern this system, if it is to produce all the good effects expected from it.

The first association for the manufacture of dairy-products in common arose in Switzerland. The manufacture of Gruyère cheese requiring of necessity a considerable quantity of milk at once, many small farmers found themselves obliged to give up making this kind of cheese. To avoid this inconvenience, several neighbours conceived the idea of lending their milk to one of them on a certain fixed day. He, with the borrowed milk and that of his own cows, made Gruyère cheese and later repaid with his own milk that he had borrowed. In this way all the members of the association each in his turn could make Gruyère. The plan turned out so well, that a place was fixed upon to which all the milk was taken, and made into cheese by one man paid by all those who furnished the milk, and the cheese was then divided among them according to the proportion of milk each had brought. Thanks to the good result of the plan, it became general, and, crossing the confines of Switzerland, spread itself rapidly over France. About A. D. 1850, it was introduced into the United-States, where the farmers formed associations for the purpose of founding establishment in which each had, as proprietor, a right proportioned to the number of cows whose milk he took thither. A man was paid, whose duty was to manufacture the goods, cheese or butter, and a committee of management chosen from the proprietors, was entrusted with the working of the factory and the sale of the products. Later, certain tradesmen, instead of going into partnership with the farmers, thought fit to found establishments where, in return for a certain remuneration they made up the milk furnished by the patrons who received at the factory their whey, and their butter or cheese, which they sold on their own account. It is this state of things that obtains almost everywhere at the present time.

As you will see, the principle that governs this combination of the milk of all the individuals in common, is that of the great benefit which the patrons or furnishers of milk reap from it. The products are better and more abundant, the trouble and the expense are less. The first thing then to be thought about in establishing a factory, is the advantage of the patrons, and every factory that is governed in opposition to this principle

is faulty in its method. But, when once this principle is observed, it is of very little importance if the proprietor make large profits. The important thing is that these profits be not made at the patrons expense. I insist upon this point, before entering into the heart of my subject, because I know that many factories have been obliged to close ; some because their proprietors tried to enrich themselves at the expense of the patrons, and others, because the patrons were determined not only to make a reasonable profit themselves, but to prevent the proprietor, on his side, from making any profit at all.

I now return to the study of the qualifications which the proprietor of a factory ought to possess to render him acceptable to the patrons, and of the relations that ought to subsist between him and those connected with him.

THE QUALIFICATIONS OF THE PROPRIETOR OR A FACTORY.

The strictest honesty, not only in fact but in appearance, is the first qualification of a factory proprietor. It is highly important that his past as a man of business, should be spotless, that the greatest confidence may subsist between him and the patrons. The farmers generally uneducated, are essentially distrustful, and from the moment that their distrust is awakened, it is a very difficult task to manage them in business. More than one man, otherwise honest enough, who has been unfortunate in business, has found himself on that account utterly unable to form business-relations with the farmers,who could not forget his past troubles, the source of insurmountable prejudices in their minds. The second qualification of the proprietor is a certain independent capital, enough to allow of his waiting a year, or even two or three, without deriving any revenue from his funds invested in the factory. And this is why such an independent fortune is necessary. It has happened that persons having a few hundred dollars in hand, constituting all their means, have invested it in the dairy-business, by building a factory, attracted as they were by the great profits which they knew to have been made by some of their acquaintances. Chance having decided that the year in which they started their factory should be a bad one, for the sale of butter and cheese, the patrons, either in the absence of a well drawn contract, or, preferring the risk of violating their contract to the risk of not getting enough for their products, ceased to frequent the factory in numbers sufficient to oblige the proprietor to close it. Even supposing the factory to have been kept

going that very year, it would have had to be closed the following year, and the unfortunate proprietor, having laid out all his means in the factory, and receiving no revenue from it, found himself deprived of everything, and obliged to sell both factory and its apparatus for next to nothing. This result, too common in our province, is disastrous in two ways : First it ruins the unfortunate proprietor : then, it renders impossible for many a day the establishment, in a district where such a disaster has happened, of a prosperous business of the same kind, since to it is attributed the failure, instead of to the real causes of the unsuccessful issue. If the proprietor is really a man of means, nothing of this sort happens. He allows the crisis to pass ; he makes up the small quantity of milk that is delivered and never closes the factory ; and when business improves, he is there, at his post, ready to welcome once more the patrons who will, infallibly, come back to him. Lastly, the third qualification requisite in the man who aims at establishing a factory, is a perfect acquaintance with the branch of business to which he intends to devote himself. In order to be perfectly qualified for his task, so as to run the least possible risk, the proprietor of a factory ought to be able to control, with thorough knowledge of their duties, the maker, the patrons, the manager, and the market ; that is, he should be able to point out the defects and the failures of each. This implies a certain knowledge of the method of working, of the quality of the milk delivered, of the price of butter and cheese, so that, knowing this thorough acquaintance with all these things, nobody can hope to deceive him. So much for the qualifications which any man who desires to open a creamery or a cheese-factory, ought to possess.

Of the relations between the proprietor and the maker.

It may be said, that the fate of a factory depends upon the maker who conducts it. In truth, the quantity and quality of the products which make the profits of the proprietor and the patrons do depend upon him. The selection, then of a good maker is of the greatest importance to the proprietor, if he wishes to see his factory prosper. Supposing him to be possessed of the third qualification mentioned above, he will be in a position to select his maker himself. In the contrary case, he must enact from the man he purposes to engage the best certificates, not only as to his capacity but also as to his moral character. It is no use for a maker to be a good workman ; if he is idle, quarrelsome, intemperate, and whimsical, the work will suffer, and very little time will elapse before the relations between him, the proprietor, and the patrons, become strained. As soon

as the character of the maker is established to the satisfaction of the proprietor, the latter should draw up a contract in writing with him, by which he should be bound to make all his goods of the best quality, and, the moment he is in default, his immediate expulsion from the factory should be justified by the same instrument. This condition is indispensable, for the losses incurred by the bad behaviour of the maker will, in even a moderate-sized factory, amount to hundreds of dollars in a short time; and it is important that the proprietor be not forced to keep a maker for even a few days after his faults have been fully proved. In this case, the sole chance of safety lies in the immediate discharge of the maker. By his contract, the maker must be held responsible for all loss caused by his fault, and that from his salary, of which, it should be stipulated, at least a month's value should remain in the hands of the proprietor for that purpose. It is unnecessary to say that the proprietor should instinctively distrust any maker, even if well recommended, who offers himself at low wages. A good maker is always worth his price, and it would be wiser to pay a high price, which would permit this contract to be made, than by paying a low one, to be obliged to accept a contract disadvantageous to the proprietor. A capital plan exists in some places, by which the maker is paid, in addition to his salary, a certain percentage on all cheese that fetches the top-price of the market. He, is thus interested in his goods making always the highest price. I have seen this practice operate greatly to the advantage of both proprietor and maker. That the maker should always feel himself under the observation of the proprietor, is absolutely necessary. He must also have assistants, and they should generally be of his own selection, for he will probably be the best judge of the men whom he has to manage, and it will aid in the smooth running of the factory to let him have his own way in this matter. In any dispute that may arise between the maker and a patron, the proprietor, who is placed as a judge between the two parties, must not decide in favour of either from fear of incurring his displeasure. The should try to arrange matters pleasantly, and avoid as much as possible lowering the maker in the eyes of the patrons in general, on account of some, probably, trifling fault. This will prevent distrust from creeping in among them, and making them too unreasonable in their demands. The rule in this case is to act discreetly, at the same time being just to both parties.

Of the relations of the proprietor with the maker.

I have seen, in many places where the farmers did not appear to be much in favour of the establishment of a factory, persons start one and

engage a maker without having any contract at all with the farmers. But I must say, that. almost invariably, those who risked their money so carelessly have had cause to repent of it. The farmers would not bind themselves, that they might be free to retire when they pleased, and the sales being bad the first mouth, they actually did retire without waiting for the final result, and, in consequence, the proprietor was ruined. It would be better not to meddle with starting a factory, than to establish one under bad conditions, and with all the risks on one's own side. The proprietor who wishes to act with prudence and discernment, must assure himself of a certain number of patrons and of cows for a fixed time, and that by a contract in waiting signed by all the parties. This contract must be favourable, not only to the proprietor, but also, and above all, to the patrons, according to the general principle laid down above : that the factories are established for the greatest possible good of the farmers. The proprietor must hold himself responsible for all the losses that happen in his factory, whether the fault be his or that of his servants, or to whatever cause it may be due, except it be " the visitation of god," irresistible force (*Force majeure.*) But, on his side, he has the right to demand from the patrons the strictest honesty in the delivery of their milk, as well as the minutest cleanliness from the moment the making begins to the time that it arrives at the factory. The price he asks from the manufacturer of the goods should be sufficient to guarantee him against all risks, and he should never consent to operate for a low price, which would endanger the prosperity of the factory in a bad season. I do not advise any proprietor to buy milk of his patrons at a fixed price. In good seasons, the patron would lose by it, in bad seasons, the proprietor. For the same reason, I do not advise the plan of charging so much per cent on the sales as the price of making the goods. It has been said that in this percentage the patrons have a guarantee that the manufacture will be carefully conducted, in order to raise the price at the sale. If good articles always fetched good prices, the logic of this would be correct, but, unfortunately, it is not so. There are years when there is no sale even for the best goods, and in such times the percentage system is a losing one for the proprietor. If it is not right that the proprietor should make money at the expense of the patrons, neither is the converse of the proposition right. A fixed price for butter and cheese of so much a pound, for making, is the only just one between the two parties. Whether the butter or the cheese sell ill or will, the cost of making is always the same and it is not fair that the proprietor should be forced to manufacture below cost price, because the sales are bad. It is only under a peculiar state of things that prices for the manufacturing ;

while remaining fixed, can vary, and that is when labour, fuel, the cartage of milk where that is done by the proprietor himself, cost more or less than else where. Then, it is true, one factory can work more cheaply than another, without injury to any body. As to this question of the cartage of milk, I am of opinion, that wherever it can be done without great cost, that is, when the factory is situated in the midst of a number of farms at handy distances, and when the roads are not too hilly, the factory had better undertake it. This would enable the proprietor to exercise greater control over the cleanliness which the patrons are bound to bestow on their cans, and, at the same time, to ease this burden from the patrons shoulders a burden which is often the cause of a factory not being established. A proprietor should see that his contract allows him, on the complaint of the maker, to send back the milk, found to be in a bad state, of any patron, and exclude the latter from the factory, if he be guilty of a repetition of the offence.

I consider that the proprietor should always avoid having anything to do with the management of the products of the factory as regards the sales. He should only engage to deliver monthly, one month after they are made up, the butter or the cheese, in good condition, and of the best quality and there his responsibility should end. All commercial transaction between the patrons and the proprietor are likely to be injurious to the proper working of the factory, as to that which concerns the relations of those interested among themselves, on account of the conflicting interests which they almost invariably provoke.

OF THE PROPRIETOR AND HIS RELATIONS WITH TRADER.

In his special department, the proprietor has necessarily to enter into transactions with certain firms, the solution of which is not a matter of indifference. If it be unwise, as I said above, for the proprietor to behave stingily to his cheese or butter-maker, it is equally unwise in him to seek for cheapness alone in his purchases for the factory. He will need rennet, coloring, salt, cotton, in addition to the raw material from which his goods are produced. He owes it to his patrons, to the maker, and to himself, for the sake of his own reputation, to purchase none of these supplies except they be of the best quality. If, as does not often happen, he himself be not a good judge of these articles, he should entrust the purchase of them to the maker, thus making him responsible for the good quality of the articles, and obviating the possibility of his pleading, in defence of some imperfection in his butter or cheese, that he could not be in fault as he was supplied with inferior commodities.

When such delicate goods as butter or cheese are concerned, no one ought to dream of employing in their manufacture anything that is not of the very best quality. In fact, nothing in this line that is not of the best should be offered in the market. But, unfortunately, competition is often the cause of inferior goods being sold low to tempt the purchaser who is too often inclined to seek for cheapness at the expense of quality. We must not forget that a cheese made with bad rennet, bound with inferior cotton, badly coloured, and put into a badly-made box, loses half its value. All these defects are easily avoided if we do business only with the best firms, whose honesty is indisputable, and whose names stand high in commercial centres. Acting thus, we shall never be taken in.

This is about all that seems necessary to be said on the subject to the proprietors of factories, of their qualifications and their relations with others. I now pass on to consider the *maker*, and will try to sketch a portrait of that I imagine a model maker ought to be.

On the Qualifications of the Maker

The maker must be thoroughly skilled in everything pertaining to his work. Skill in his trade, alone, will not do, he must love it, be devoted to it, study all the new improvements and apparatus which are yearly brought out, learn the use of all the systems of management in vogue, that he may be able to apply them if necessary, so as not to be liable to lose a good place through ignorance of these matters. He must be able to read, write, to calculate, and know both French and English, and be acquainted with every thing necessary to render him independent in the factory, so that he may direct his assistants properly in the performance of their duties, and never find himself exposed to their criticisms, or at their mercy, through errors on his part, which would infallibly lose to him their confidence, and lead them to acts of insubordination. If a maker is to be thoroughly qualified for his place, these are the qualities he must possess, and, possessing them, he can command a salary in proportion to the services he is able to render. Other qualifications, he must have which will be of especial utility in his relations with the person who engages him.

Relations between the Proprietor and the Maker

For in truth, if the proprietor has certain duties to perform towards the maker, no less is the maker bound to the discharge of certain duties to the proprietor, of which duties he cannot acquit himself unless he possess the four following qualifications : honesty, activity, cleanliness, and sobriety. Whatever other qualifications he may possess, if the maker

be dishonest, lazy, filthy in his habits, or intemperate, he will never be worth his salt. The honesty of which I speak does not consist alone in not stealing the milk, butter,and cheese,but in regarding himself as the proprietor's representative in the factory, in protecting his interests as if they were his, the maker's own, and in protecting them, always within the limits of equity when any dispute arises between the patrons and the proprietor. His activity should be exercised over every part of the work, from the most important, down to the most trivial detail. It involves an incessant watchfulness over all the operations of the manufacture, especially those which are performed by his assistants. As to cleanliness, that, in dairy-work, is half the battle. It must be scrupulously exact. Every source of foul odours, every cause of putrefaction, must be peremptorily expelled. Sour milk, dirty vessels, slops, the fumes of tobacco, all must be banished from the factory. During working-hours, at least, the maker must be tidy in his dress, and clean as to his person. Sobriety does not imply only abstinence from strong drink,which interferes with the quickness of perception, induces laziness, and causes the committing of gross faults during the processes of manufacture ; but it also implies the absence of bad habits such as smoking and chewing in the factory. It embraces also that *moral* sobriety, which forbids the use of oaths, bad language, and the habit of giving orders to the assistants in a coarse and brutal manner, a habit which more than anything else, tends to create a bad feeling between the maker and his assistants, than which nothing is more detrimental to the proper working of a factory. To sum up ; when an inspector, in the discharge of his official duties, enters a factory, he should neither see, hear, nor smell anything to inform his nose, ear, or eye, that anything abnormal or irregular exists in the establishment.

Relations Between the Maker and the Patrons

The nature of the relations between the maker and the patrons is often a stumbling-block which hinders the succes of a factory. The first connection that occurs between them is at the weighing of the milk. That is the moment which the maker should choose to inspect the milk brought to the factory. He is bound, for the preservation of the interest of the proprietor, of his own reputation, and of the common interests of the patrons to point out any deterioration that may be found in the milk,whether it be owing to want of cleanliness, to negligence, or the dishonesty of him who brings it. At the first suspicien, he will hold his tongue, retaining the milk for examination. But, if it occurs again, he must privately warn the culprit who if the cause be due simply to negligence or want of cleanliness, will be in a posi-

tion to remedy the evil at once, or if dishonesty be the cause, seeing himself discovered, he will cease to defraud, or if he persist in it, will deserve to be denounced to the proprietor, who will exclude him from the factory. The weighing-books must be kept with the most perfect correctness, and in such a form that any complaints formulated by the patrons may be answered at a glance. The makers must always speak politely to any complainant, not showing that he is offended, but giving him satisfaction at once, either by showing that the error is imaginary, or by admitting the mistake, if there be one, without trying to cast the blame on others, by lies or craft, to relieve himself from the responsibility which falls upon him. This is the surest way for the maker to earn the good-will of the patrons, and to gain their respect. If, in any dispute between the proprietor and the patrons, the maker is obliged to intervene, he must behave with discretion, with uprightness, and impartiality, and avoid anything like acrimony in the discussion.

The relations between the maker and his assistants.

I remarked just now, that the hiring of the hands ought, as far as possible, to be left to the maker, in order to secure as much smoothness as possible in the working of the factory. At any rate, whether they be hired by the proprietor or the maker, there is only one way in which the latter can direct them satisfactorily : let him intrust no operations to their care except such as they can execute properly, and never allow them to endanger the prosperity of the establishment by their ignorance or their carelessness. Has he any apprentices ? He should impart to them all his knowledge of the business, and strive to teach them their trade in such a manner that they may do him credit. For he may be sure of one thing ; if any one whom he has taught, fail as a maker of butter or cheese, the first excuse the man makes will be : Oh ! I was never properly taught by Mr. ..... The maker ought to see that his men are honest, sober, active and orderly, as long, at least, as they are under his eye in the factory. His orders should be given with firmness, but at the same time with mildness, and, if he wishes to preserve his authority over the men, he should be careful not to have to correct any orders given by mistake, and not to allow any order once given to be neglected on purpose or from evil design. One act of disobedience brings others in its train ; want of respect follows, and the good understanding which should exist between the maker and his men is soon at an end. All that I have insisted upon implies an ever increasing watchfulness over his men on the part of the maker.

After the maker come the patrons, whose duties are no les important than those of the other factors of the dairy-business, of which we have hitherto been speaking.

The Relations of the Patrons with the Proprietors.

Of all the duties of the patrons to the proprietor the most important is, never to deliver anything but pure milk at the factory. Any-one who skims his milk, who retains the strippings, who puts water or any other dilutent into his milk, or who delivers his milk in a dirty or sour state, is a thief. A severe character, but a just one. He robs the proprietor, who by his act is exposed to the chance of delivering goods inferior to the sample in quality, and has, in consequence, to pay damages to the purchaser ; he robs his brother-patrons at the same factory, for he takes part of the sales-money which, by rights, should be theirs, the amount of which he has reduced in proportion to the quantity of bad milk he has delivered ; he robs the cheese-buyers, who, perhaps, make their purchases at a season when the defects caused by his bad-milk are not obvious, though they may become apparent after the dealer has them in his store, when he is sure to lose by his bargain.

Another duty of the patrons is not to keep on bothering the proprietor because the season is a bad one, and the goods do not fetch the price they expected. If the trouble they so unjustly give causes the proprietor to close his factory, they will be responsible, *in foro conscientiæ*, for all the injury they have brought about.

The most villainous of all the faults of which patrons are guilty is envy. In good seasons, if no accidents happen in the factory, the proprietor does well, and gets a good return for his outlay. This is only fair, for his risk is great. In spite of every precaution, it will happen that inferior goods are made, and it does not take much bad butter or cheese to cause a serious diminution in the profits expected. With such hazards, what moneyed man would be fool enough to invest sums in the dairy-business, that will very likely not return him more than six or seven per cent, at most, even if he meet with no accidental losses. That is about the interest money reaps in first class mortgages, and the investor has no need to run about for the payment, which seeks the capitalist in his office, without trouble or risk on his part. Nevertheless, I have known patrons so envious, sodesirous of setting their feet or the neck of an unfortunate proprietor, who had no written contract with them, as to force him to manufacture their milk at almost a loss, at the risk, if he refused, of seeing his factory shut up.

When once the patrons have signed a contract favourable, in the first instance, to themselves, and in the second to the proprietor, they should behave with uprightness and liberality to him, that their mutual relations may bear the impress of perfect honour and honesty.

HOW THE PATRONS SHOULD BEHAVE TOWARDS THE MAKER.

If the patrons behave properly towards the proprietor, they will rarely fail to get on well with the maker. Circumstances, however, will occur, where, whether by mischance, or by inattention, the patrons bring hard milk to the factory. They must not take offence, if the maker points out the defects to them, and begs them to be more careful. On the contrary, their duty is to search out the cause of the damage, and to put a stopper on it for the future. If on the other hand, the maker commits some mistake in weighing the milk, the patrons should not shout out : He is robbing us ! but they should ask calmly for an explanation, and if this is given in the presence of the proprietor, it will seldom fail to make matters assume a more cheerful appearance. The important point in a matter of this sort is, not to impute to the one who turns out to have been in fault the slightest suspicion of having acted thus on purpose, unless the contrary be clearly proved.

All that remains is to discuss the mode of carrying on the factory. The word here used, has but a limited meaning, since it is conconnected only with that part of the management that concerns the sales. It is now generally considered that the sales should be entrusted to a manager who is a good man of business.

Qualification of the Manager.

This agent of the patrons of the factory must be acquainted with all the secrets of the trade, that is, with all the details of the dealings in butter and cheese. He must be an excellent judge of the products he has to sell that he may not be duped by those buyers who often seek to cry down goods that they may buy them at a lower price. Honesty, knowledge, and skill, are then the three qualities which the Manager of a factory ought to possess.

The Relations of the Manager with the Patrons.

The Manager generally receives a commission of so much per cent on the sales he makes, and this commission is supposed to pay all the expenses of the agency. The manager, in return for this commission, receives all the butter or cheese from the proprietor, every month ; sells it, distributes the total weight amongst the patrons, in accordance with the maker's

weight book, collects the money, and in all these transactions is bound to consult the board of directors chosen by the patrons. He should not, however, accept the office of manager unless he is allowed a certain latitude, without which his business will be difficult to transact, unless the patrons compel him to submit it to the decision of the board without responsibility on his part. This, I consider, would show a great want of shrewdness on their part, since it reduces the position of the manager to that of a simple clerk. The committee or the manager should follow attentively the course of the markets, and always act in the sole interests of the patrons; for they may be perfectly sure that those dealers with whom they have to do, will be pretty well sure to take proper care of their own interests.

The Relations between the Manager and the Patrons.

The manager, in order to do thorough justice to the patrons, ought to do business with no firms except those of indisputable respectability. He must distrust those nameless speculators who are always on the look out for bargains profitable to themselves alone. He must watch the markets daily, and sell what he has in hand every month. Cheese loses weight quickly, and if it is kept long, there will be so much lost. As butter grows old, it loses flavour, and the general opinion is, that it should be sold every month at the current market price. Keeping back goods causes over-stocked markets, and that sudden rise-and-fall that so often produces financial disasters. A maker, who has twelve or fifteen years experience, told me one day that he had never deviated from the rule of selling all his disposable goods every month, and that, by following it, he obtained, on an average, the highest market prices. I found no difficulty in believing him, for, by keeping back the goods from sale, loss is incurred in weight and quality, and by the interest of the money, the receipt of which is delayed.

This is about all I have to say, Mr. President and Gentlemen, on the subject I selected for your entertainment to-day.

The statement I made about the four factors involved in the working of creameries and cheese-factories conveys the idea that, in the dairy-business, as in all others, the greater the number of those who thrust their hand into the dish, the less will be the share of each individual in the profits.

It is an idea which has led some to seek for a system which should reduce the number of *middle-men* between the producer of the milk, and the purchaser of the butter and cheese. The ideal system would be disco-

vered in a farmer with a great number of cows of his own, and having on his farm a factory under his sole control, the products of which he himself would sell. An ideal difficult of realization ; but a proposal has been made to institute something like it by the following plan : A maker of butter and cheese opens a factory, and buys the farmers' milk at a price determined in this way : for instance ; in the district of Montreal, it is agreed upon to sell milk by the 10 lbs., and these ten pounds are to be valued, say for the month, of June, at the highest average price paid for the best cheese during the following month, July,on the Montreal market ; it being understood that it takes ten pounds of milk to make a pound of cheese, and deducting from that price two cents, for the profit of the cheese-maker and the buyer of the milk. To make the matter clearer, I will give an example. If July cheese were worth an average of ten cts. a pound at Montreal. June milk would be worth eight cents. The purchaser, while paying the highest market-price for milk, would not be exposed to incur losses from the fluctuations of the same market. This system would compel the purchaser to utilize the whey which remained in his hands, and for that purpose he would have to rear pigs or other animals to consume it. One objection made to this plan is that by it the farmer would lose the whey which it required for his own animals. There would be nothing to hinder any one who felt this objection from keeping enough milk at home to supply his family and to provide butter for its use, which would furnish at the same time sufficient skim-milk for his young animals.

I have now arrived, Mr. President and Gentlemen, at the end of my address. Certain of the principles I have laid down in it may appear to some to be too positive, but observe, please, that I have treated the dairy business from a general point of view, and not from a special point, created by circumstances for particular people. I wished to show that certain rules, adopted in some places, to obviate inconveniences caused by want of experience, give better results than others, and that the whole of these rules present a sort of programme which, so to speak, has become necessarily observed in the greatest number of factories now at work, and may be of the greatest assistance to those which in future shall be in any way interested in the business of the dairy. Indeed I was led to choose this subject by the great number of requests I receive every year for information as to the establishment of factories, the amount of skill required in the makers, the basis of the agreement to be drawn up between the proprietors and the patrons, I fancied there could be no better way of replying to these inquiries in a general and useful manner, so that my answer should be

of service not only for the present but also in the future, to all those interested in the subject. The statement of some of the rules I have laid down may also have the advantage of causing a discussion of them here, where are so many experts gathered together, who have more skill and capacity to investigate them than I possess, and who as well as all of you, gentlemen, have had the goodness to listen to me with a degree of kind attention for which I gratefully thank you.

J. C. CHAPAIS,

ADDRESS OF MR. LESAGE,

Assistant Commissioner of Agriculture.

Mr. President and Gentlemen,

At this late hour of the evening, I will not attempt to make you a speech. I will content myself with addressing a few words of congratulation to you, and with rejoicing with you at the increasing success of our association.

I was indescribably delighted at hearing the interesbly discussions carried on this afternoon, at the intelligent questions which were put from all sides of the hall, and at the thoroughly pertinent replies which were made on all the points which were raised. The question then under discussion, was the wisdom or folly of making skim-milk cheese. It interested me greatly. According to the admissions which were made on both sides, it seems evident to me that the difference between the results obtained from the manufacture of skim-milk and full-milk-chease, is not very great; and I think that the statements which were made during the discussion, should sufficie to persuade the greater part of those who are now engaged in the dangerous combined system of cheese-making to abandon it as soon as possible. In truth, Gentlemen, we are not yet sufficiently advanced, our reputation is not sufficiently impregnable, as far as regards our cheese, to warrant us in attempting so perilous a manufacture as that of partially-skimmed-cheese. It is a well established fact, that our cheese-makers are not, at least the majority of them, sufficiently skilled to enable them to make perfect cheese. Every one admits too, that to make skim-cheese requires more skill than to make full-milk-cheese. Therefore, those who are not in the business, like myself and many others cannot help saying, that it is for the interest of all, of the Dominion as well as of the province, to endeavour to maintain our reputation for honesty, since we have not, as yet, earned a general reputation for skill.

Our reputation for honest dealing it is that has won our success on the European market. It is this reputation for honest dealing which, in every possible way, we should try to maintain ; and, even if we must sacrifice some of our profits, I do not hesitate to advise those who devote themselves to this trade, to avoid putting their future in danger by a too widely grasping greed.

The question was discussed this afternoon, whether it would be well to remedy the evil we complain of by getting the federal legislature to establish a system of inspection and brands for those cheeses that are not made out of full-milk. If the manufacture of skims continues, we shall, doubtless have to have recourse to some means of this sort, especially if the dealers persist in buying half-skims. It is rather to them we should address ourselves, begging them to refuse to buy all cheeses that are not made of the entire milk. If the gentlemen cared to do it, I believe they would, in a great measure, put a stop to the practice in question.

But, I believe the brand to be a remedy that would do more harm than good ; for I would rather that the foreigner did not know that we made skim-cheese here. As soon as Canadian cheese branded "Skim", appears on the market, all cheese from our country will be regarded with suspicion.

And, so, I believe, I interpret the general interest of this province, in begging and praying those who have any influence to agree to blot out this practice which I hold, to be threateningly dangerous to the business of cheese-making.

I feel that in embarking in the business of manufacturing butter and cheese, the farmers of the province of Quebec have entered upon a stream of prosperity, the surest of all those that lay open to them.

As was very well said by some who preceded me, among others by Mr Bernatchez, with the cheese-business, we find an expedient for multiplying all our products, for first we must improve the way of feeding our stock, and thereby improve their manure, both in quantity and in quality ; the land is improved, and the returns are increased all along the line.

It is this business that was needed for the province of Quebec. We have sought but we have not yet found anything which leads with so much certainty to prosperity. There is not, probably, one branch of our trade for which we have an outlet so easy and so capable of extension.

We have, it is clear in the valley of the St. Lawrence (I am not speaking of the province of Quebec alone, but of its entire course, we have on the

Americain continent, the valley the best suited to pasturage, the best ad apted to the production of butter and cheese. Our climate is better than that of our neighbours ; our grasses and our fodder-crops are coveted by them. Lastly, we have no rivals on the continent in the manufacture of these two articles, always on the condition of their being of the best quality. Well ! Let us take care that nothing hinders this movement, for it is the best that has ever been begun among us.

I wish, gentlemen, to say a few words about our stock. Each time that I have spoken at our meetings, I drew your attention to the importance of improving our cattle, especially our Canadian cattle. The competions opened by our association have proved that the Canadian cow, properly fed, is inferior, as regards quantity and quality of milk, to no one of the best races imported. They are still sufficiently numerous in some parts of the province, to be preserved, and improved by selection, which should be encouraged by all those who have at heart the interest of the progress of the dairy-business.

Since I have enjoyed the advantage of belonging to the Department of Agriculture, I have given my most earnest assistance to everything that was doing for the improvement of our herds by means of the importation of foreign breeds and I am happy to find that the amount of good produced by these importations has been considerable. But, for the small farmer, for him who has not the means of buying a herd of imported cattle I contend that the best thing he can do is to form a herd of indigenous cattle. With proper and intelligent care in the selection, he may be sure of possessing in a few years a most profitable herd of cattle.

With a view to give to this indigenous race all the encouragement it deserves, special prizes were offered at the provincial exhibition at Sherbrooke, in 1886, for the best Canadian cattle ; but unfortunately, no one tried to benefit by the prizes.

This year we were more fortunate. At the provincial exhibition at Quebec, we had on the grounds not less than 60 head of Canadian stock. I do not hesitate to say, that out of these 60 animals there were at least 40 which were at all points the equal of the animals of the other races, I do not think I am going too far in saying that there were as last half a score of Canadian cows superior to all those on the fair grounds except the Jerseys.

It was the first time for twenty years that the Canadian race of cattle had its place in the list of prizes at a provincial exhibition, and I flatter myself that the experiment was sufficiently satisfactory to insure its always having its place for the future, in all our exhibitions.

In order to give the greatest possible importance to the introduction of our Canadian stock into a provincial exhibition, the committee chose a special jury to examine them, composed of Professor Brown, of Guelph, Ontario ; Dr Huskins, of Newport, Vermont ; and Dr. Couture, V.S. ; three men who are great authorities in the agricultural world. These gentlemen were unanimous in recognizing the excellence of our indigenous cattle, as regards their milking qualities. Professor Brown even collected the members of the committee who were in the grounds, and told us now highly he appreciated our stock, and advised us to take the greatest possible care of them, adding. that in his opinion, there was no more profitable stock to keep, and that we would import none of so much value if, only, we would give them the care and food adapted to make them attain the highest possible degree of productiveness.

To our association is due a large part of this first success, for it is owing to the competition opened by it for Canadian cows, that their merits have been brought into the full light of day. The register and the herd-book, which were established at our last meeting, will continue the work of rehabilitation which it then so well began. Let all my hearers who have good Canadian cows prepare them for the future competitions and exhibitions ; enrol them in the herd-book ; and shun all alliances with other breeds. The rules make no exception, except as to Guernseys and Jerseys, which are considered as having originally sprung from the same stock.

I cannot insist two earnestly on the necessity of enrolment in the herd-book. This mode of preserving the race pure, when once established, will more than double the market price of the registered cattle, and, despised, so they have long been, they will become, perhaps shortly, the most appreciated of all stock.

And now, gentlemen, let me, in closing my remarks, thank you in the name of the government I represent for the valuable assistance you afford it, in coming here in such numbers to labour for the advancement of the agricultural interests of our province. It gave me pleasure to see three members of the Legislative Assembly taking part in the deliberations ; and they will not fail, I am sure, to recommend the continuance of a liberal grant to our association.

I thank you, gentleman, for the attention with which you have listened to me. Should occasion offer itself, I shall address you to-morrow on another subject.

THE MEETING OF THE MONTREAL HORTICULTURAL SOCIETY AT QUEBEC.

Mr. Lesage.—I profit by a moment's intermission to inform the association that a meeting of the Fruit-growers' association will shortly be held, under the patronage of the Horticultural Society of Montreal.

Mr. Gibb, of Abbotsford, has arranged for a meeting to be held at Quebec, at the beginning of the next session.

Mr. Browning and Mr. Gibb, who have both taken the initiative in promoting this meeting, are desirous of attracting to it all those in the province who are interested in the cultivation of fruit-trees. These gentlemen are accustomed to hold their meeting at Montreal or in its vicinity. In order to enlargs the circle of the operations of the society, they have thought fit to call their next meeting at Quebec, during the first days of the session ; hoping thereby to reach a fresh portion of the population.

The idea is not a bad one ; for the cultivation of fruit-trees at Quebec differs from that which is practised in the district of Montreal ; and it is possible that, by persuading to be present some of those who, below Quebec, devote themselves, with much intelligence, to this sort of cultivation, the district of Montreal may profit much by the information ; they are in a condition to afford it. Besides, the farmers of Quebec, and of the far Eastern part of the province, cannot fail to benefit greatly, in their turn, from the teaching and new methods of those who follow the same pursuit in the district of Montreal.

I am glad that Mr. Gibb, in the telegram he has just sent me, has reminded me of this, and I profit by the occasion to request all who are interested in fruit-growing to bear in mind that this meeting will be discharging the duty of good citizens in being present at it, and in preparing for the meeting all the information it may be in their power to lay before the public for its benefit.

The date of the meeting is not yet fixed, because it depends upon the date of the opening of the session, and this may to all appearance, be still delayed for a considerable time. But I mention the thing, that every body may take note of it, and be prepared when the date of the meeting shall be advertised. This will be done soon enough to allow all those who wish to be present to be there in time.

MEETING OF THE ASSOCIATION, 1889, AT L'ASSOMPTION.

Mr. Marsan.

Since we are on the question of conventions, it would be perhaps opportune to settle the place where the next meeting of this Association shall be held.

I know that St. Hyacinthe always desires to be the place of meeting, and a better place cannot be found ; but, as Mr. Lesage has just said, on behalf of the Fruit-growers' Association, it may be useful for societies of of this class, to increase the number of their members and extend their influence more widely, and the best way to do this is to make themselves known throughout the different regions of the country.

Therefore, I will invite in the name of the regions of the North, and I will make myself the interpreter of all the farmers of the district of Joliette and the neighbourhood, this Association to hold its next convention at l'Assomption.

You will, perhaps, find me presumptuous, seeing that we have only just begun to bear the name of *a town* ; but I make this proposal to encourage the Association, and to win for it a greater number of adherents.

I know that wherever the Association has held its meetings, immense benefits have been thereby derived. It sprang into life at St.-Hyacinthe, which, as the agricultural centre of the most advanced district of the country, is worthy of being its birth place ; but it would only be reasonable that other parts of the province which, owing to uncontrolable circumstances have not had the same advantages, should also enjoy a visit from the association.

I am certain that in coming to our district, the association would bear effective fruits, and attract adherents. For my part, I pledge myself to do my best to obtain adherents to it.

We shall be forestalling the wishes of our entire population ; and I may say without absolutely promising it, that we shall have a hall there. perfectly well adapted to our sessions : the hall of the college.

I am also sure, that the farmers of the North-Shore, all the advanced ones, will make it a duty to be present at the meeting. The association does not simply aim at the direct advancement of the dairy-trade, but at the advancement of agriculture in general, since the business of the dairy is closely allied to the general cultivation of the land. There, the farmers will gain previous information ; and I am sure, to wind up, that the association will confer great benefits on that region, and, later, can go on to scatter its benign influence on a wide scale throughout the whole land.

Were it necessary, I would make a motion to this effect.

The President.—I will refer your request to the board of directors.

COMPETITION OF CANADIAN MILCH-COWS

Report of the only test made in this competition, for 1887.

Cow, the property of Mr. Philias Jerôme, St. Thérèse de Blainville, in the county of Terrebonne.

" La Barrée " 8 years old, red and brown, 650 to 700 pounds, dropped last calf July 8th 1817.

Test-begun 23rd Sept. weight of milk each day :

	lbs.	oz.
1st day	26	15
2nd "	25	—
3rd "	27	13
4th "	27	13
5th "	26	2
6th "	26	14
7th "	26	14

Cream :

1st churning	11	10
2nd "	14	12

Butter :

1st churning	5	7
2nd "	6	15

Total butter made : 12 lbs. 6 oz.

Food : Cow at grass, very poor feed. Additional food : three pailsful of mash a day ($\frac{1}{3}$ bran, shorts.)

Milk set in tin pans :

The First porize in the competition was adjuged to Mr. Jérôme :— $40.00.

THE SECRETARY.

THE REPORT OF THE DIRECTION

The undersigned, retiring directors, have the honour to make the following report of their operations of the last year.

Subscriptions.

It is very agreeable to be able to show the increasing number of members of this association. In 1887, 294 persons paid their subscriptions as members of the association,—$1, against 253 in 1886; 210 in 1885, 117 in 1834, 66 in 1883, and 70 in 1882.

The names of the members appear in the annexed schedule.

Finances of the Association.

As usual, the Association, has mantained an equilibrium in its finances, while making as judicious a use as possible of the resources at its disposal.

At the meeting at Three Rivers, 19th. and 20th. January, 1887, the following resolution was adopted:

That the Dairymen's Association, in convention at Three Rivers, name a committee composed of all the officers and directors of the Association, to communicate with the committee in Agriculture of the Provincial Legislature, for the purpose of obtaining, though its intervention, that the government for the future, take upon itself the duty of paying the entire salaries of the inspectors of the Association, and defraying expenses of printing its annual report; and to confer with the said committee on all the suggestions that have been, or shall be made at the present meeting.

A delegated committee of the board of directors thus formed, met the committee on Agriculture of the lower chamber at Quebec in the following April.

After having heard the memorandum annexed to this report, and after having heard the vice-president of the Association, the Revd. Mr Gérin, as well as the directors present, the committee unanimously adopted the following resolution, which, though not precisely what the Association desired, nevertheless constituted an increase of the means at its disposal:

"That, in its opinion, the grant and indirect assistance heretofore accorded to the Dairymen's Association ought to be continued.

"Your committee recommend in addition, that the Dairymen's Association receive in addition to these grants, from the sums voted in aid of the dairy-industry, a sum of five-hundred dollars, to enable it to add a third professor-inspector to its staff of instructors, the same to be named by the government. (13th April. 1887.)

The staff of inspectors was increased by the carrying out of this advice but the balance-sheet of the Association remained in nearly the same state, as it was in the preceding years, the government paying the salary of the third professor, as well as his travelling expenses, instead of handing over directly to the Association this sum of five hundred dollars.

The following table gives receipts and expenditure of the Association since its establishment:

RECEIPTS.

——	1883	1884	1885	1886	1887	Gd. Total.
Grant	1000 00	2000 00	999 97	1000 00	1000 00	
Subscriptions	136 00	117 00	210 00	253 00	294 00	
Sale of reports	1 50	121 25	2 00	3 05	1 00	
Received from factories visited	54 05	5 00	40 00	33 00	.....	
Interest on deposit	10 00	39 56	15 90	15 00	10 00	
School factory	.....	300 00	300 00	300 00	300 00	
Sundries	.....	.....	2 20	16 05	3 50	
Repaid to Association for London Exhibition	.....	.....	.....	.....	116 64	
	$1201 55	2582 81	1570 07	1620 10	1725 14	$8699 67

EXPENSES.

Printing	122 25	349 25	140 00	292 25	202 00	
Paper and stamps	38 58	17 06	50 84	53 07	43 72	
Travelling expenses of officers and directors	244 25	7 65	20 40	48 00	24 70	
Meetings	104 09	166 48	43 74	262 31	134 65	
Salaries and school factory	550 50	1149 50	1000 00	1050 00	900 00	
Travelling expenses of professors	73 67	89 10	235 69	223 54	228 14	
Competitions	.....	.....	50 00	210 00	120 25	
Purchase of books and subscriptions	.....	.....	40 75	44 28	4 80	
Extra expenses at the London Exhibition, &c	.....	.....	.....	.....	187 65	
	$1133 34	1779 04	1581 42	2183 45	1845 91	$8523 16
Balance in hand Jan. 12th. 1888	.....	.....	.....	.....	.....	$ 176 51

The Association having only begun its effective work in 1883, and having received, that year, its annual grant from 1st July, 1882, have, in consequence, $500 in hand, on which it has drawn a little every year. This year, this reserve of $500 was found to be three parts spent, and next year it will be all gone. We said just now that the new grant to the association had not increased the means at its disposal: the alternative stated in the memorandum we spoke of must inevitably be taken next year.

" The only means of balancing the finances of the Association, if it is " not to receive from the government the assistance it has a right to expect, " will be to restrict its sphere of action, a means which will certainly tend " to the injury of the true interest of the dairy-trade, and one which the " weighty evidence we have received of the value of the labours of the " Association will certainly not justify us in practising."

The new board of directors will then, have to busy themselves about the means of arranging the difficulty.

Instruction.

Inspection of Factories—The Association has had three inspectors on the road during the last season :–Messrs. J. M. Archambault, Jos Painchaud, and Saül Côté ; the two last were engaged and paid by the government.

Up to the present time, the directors had charged a small fee to those who kept the inspectors at their factories for a whole day. The revenues from that source, in 1886, only amounting to $33.00, there was no good to be derived from continuing to exact the fee, which might have the effect of inducing people, who were nevertheless in need of our instructors to dispense with their services. The visits this year were gratuitous, and the inspectors were instructed to pass one day in each of the factories where it was wished to retain them.

The following are the details of the visits made during the last season. It must be observed that Messrs. Painchaud and Côté were detained at Quebec for nearly a month by the government and the committee of the provincial exhibition in September, to assist in getting things in order for that show.

Establishments visited

	Cheese factories.		Creameries.			Combined system in the figures given in the cheese factories.	Details of the visit.			Entire number of visits
	Cheddar Process.	Old Process.	Centrifuges.	Pans.	Cream purchased.		Less than a day.	Whole day.	Visits Repeated	
J. M. Archambault	96	15	1	..	..	.....	36	76	19	131
Jos. Painchaud.	40	9	17	9	..	9	6	69	....	75
Saul Côte.	28	38	7	..	1	.....	22	52	....	74
	164	62	25	9	1	.....	64	197	....	280
Totals	226		35							
	261 Factories.									

The annexed memorandum contains the details of the inspections made during the previous years. But it is useful to note a considerable alteration caused by the exertions of the Association In 1884, there were not probably five cheese-factories in the province of Quebec working on the Cheddar system ; the Association, that year, recommended its adoption to the members, and taught it to them in accordance with its practice in the McPherson factories. Now, in 1887, out of 226 factories visited, 164 work on the Cheddar process ; this change has been effected principally in the parts visited by Messrs. Archambault and Painchaud, where the Association has the greatest number, of members and where it has always, from its infancy, received the firmest support. The region of Lake St. John should be mentioned, where all the factories visited by Mr. Côté follow the Cheddar-system. The movement also is extending by degrees to those factories that are not connected with the Association ; the greater number of those which follow the old fashioned practice are not attached to the Association.

For other details we refer to the reports of the inspectors.

This year, the inspectors gave to the managers of the factories visited a copy of the notes they took during the inspection. These notes show the state of each factory at the time of the inspector's visit.

School Factory.

The school-factory of Notre-Dame de St. Hyacinthe received visits this year from 53 makers, who, altogether, passed 125 days in the factory. This result proves the importance of the Association having under its control a school of practice open, early in the spring and always ready to receive makers who, at any given time, may be in immediate want of information. Mr. MacDonald, who had filled in 1886, the post of cheese maker at the school, occupied the same position in 1887, and contributed greatly to the improvement of the manufacture.

Competition of Canadian Cows.

This competition did not meet, this year, with the success expected There were only two entries and but one test. For reasons beyond the control of the association, the advertisements were sent out late, and this was probably the cause of the failure of the competition. Mr. Philias Jérôme, whose cow made 12lbs doz. of butter in 7 days, although alone in the competition-test, having fulfilled the conditions imposed, is entitled to the prize of $40,00. The directors, in order not to allow the work of regenerating our Canadian cattle whose qualities are well known, to fall to the ground recommend the competition to be extended to 1888. The great

number and the good points of the Canadian stock, pure and crossed, exhibited at Quebec at the provincial exhibition last September, show that a real movement has been begun. The failure of the last competition may be due to causes which will disappear next year, and it is to be hoped that the number of competitors will in 1888 be considerable. The prizes offered are liberal enough to encourage entries in the competition.

THE ANNUAL REPORT AND PRINTING.

The report printed during the past year with its 200 pages and the abondance and variety of matters therein treated is in no way inferior to its predescessors.

The association has distributed a great number of copies of the instructions on the care to be taken of milk, printed last year. In addition, it has printed and distributed among its members a condensed table of the different processes of cheese-making. This table, prepared by the inspectors has done much good. For the following year, it is thought advisable that the association print tables of the same kind concerning the making of butter, and the testing of milk at the factories.

SAMPLES OF BUTTER AND CHEESE

In conformity with a resolution passed at Three-Rivers' meeting, the association has purchased samples of full-milk cheese from the school-factory of St. Hyacinthe, and of half-skims made at St. Denis *en bas*. These samples have been kept in the cellar of Messrs. M. Hannan and Co, of Montreal, who have been kind enough to make no charge to the association for this service. Experts will have to be appointed at the convention to examine and judge these samples.

Mr. Alexis Chicoine, also who every year gives fresh proofs of a spirit of research, will submit to the association for examination eight samples of butter, made from the same cream, and preserved under conditions common to all the samples. The board mention these facts, in order to show how easily makers could render services to the association were they only to follow the exemple of Mr. Chicoine. Let each of them devote himself to the elucidation of *one* obscure point, and give a report of his experiments to that end at the annual meeting, and in this way our association will be of immense service to the dairy-industry.

The board considers the results of the past year to be very encouraging, and promising well for the future of the Dairymen's Association.

The prices obtained for cheese, in 1887, were satisfactory, and, indeed in certain cases, high; and, indeed, those farmers who now appreciate the importance of the dairy-business, have received a just reward for their labour.

Respectfully submitted,

THE DIRECTORS OF THE DAIRYMEN'S ASSOCIATION OF THE PROVINCE OF QUEBEC.

By the Secretary-Treasurer,

J. DE L. TACHÉ,

ST-HYACINTHE, January 11th. 1888.

LIST OF MEMBERS, FOR THE YEAR 1887.

A

Adam, Jules.....Belœil.
Adam, Delvica.....St. Valérien.
Aganière, Albert.....St. Malo d'Auckland.
Alix, Joseph.....St. Césaire.
Alarie, P.....Pointe du Lac.
Allard, J. N.....St. Jean Bte. de Rouville.
Archambault, Alfred.....St. Guillaume.
Archambault, J. Misael.....St. Hyacinthe.
Archambault, Osias.....St. Jean Bte. de Rouville.
Angers, Paschal.....St. Dominique de Chicoutimi.
Asselin, Charles.....Durham-South.
Ayotte, Ludger.....Pont-de-Maskinongé.

B

Blondin, F. X.....St. Maurice-Champlain.
Beauregard, Hector.....La Présentation.
Bernard, E. A.....Trois-Rivières.
Brodeur, L. T.....St. Hugues.
Bernatchez, Numa.....Montmagny.
Bernatchez, N.....Montmagny.
Bélanger, Boniface.....St. Jean-Port-Joli.
Bourque, Norbert.....Sherbrooke-East.
Bélisle, Achille.....La Baie du-Febvre.
Beaudry, Pierre.....St. Jean Bte. de Rouville.
Blain, Félix.....Belœil.
Beaudry, Jos., et Frère.....St. Jérôme.
Brodie & Harvie.....Montréal.
Bourbeau, Elie.....St. Césaire.
Bachand, Ludger.....Roxton-Pond.
Barrière, Thomas, fils.....Mount-Johnson.
Berthiaume, J. B.....Rivière Gagnon.
Bureau, J. Napoléon.....Three-Rivers.
Bettez, Henry.....Ste. Marguerite de Trois-Rivières.
Beaudry, William.....Ste. Marguerite de Trois-Rivières.
Bourgeois, Hon. Judge.....Trois-Rivières.
Bédard, Joseph.....Ste. Marie de Monnoir.
Boucherville, Hon. Ch. de.....Boucherville.
Bourque, Désiré.....St. Barnabé.

Blanchard, Joseph.....Ste. Madeleine.
Boucher, Jos.....St. Damien de Berthier.
Bergeron, Henri.....St. Didace.
Bernier, Alphonse.....Ste. Claire.
Brassard, Joseph.....Rivière-aux-Sables.
Bessette, Ludger.....Ste. Angèle de Monnoir.
Beauregard, Jos.....St. Jean Baptiste.
Bruno, Dr. Adolphe.....Sorel.
Bergeron, Edmond.....Chicoutimi.
Boily, Roger.....St. Alexis de Chicoutimi.
Bouchard, Jos.....La Malbaie.
Bécigneul, Eugène.....Moulins-Nantais.

C

Chartier, Rev. J. B.....St. Hyacinthe.
Caron, Gabriel.....Louiseville.
Chicoine, Alexis.....St. Marc.
Côté, Saül.....St. Flavien.
Côté, Louis.....L'Avenir.
Casavant, Antoine.....St. Dominique.
Chapais, J. C.....St. Denis.
Chènevert, Jos.....St. Cuthbert.
Coulombe, Dr. C. J.....St. Justin.
Champagne, Joseph.....St. Guillaume.
Couture, Dr. J. A.....Quebec.
Caron, George.....St. Léon.
Carignan, Thos.....St. Pie.
Chevalier, P.....St. Bazile-le-Grand.
Chagnon, Antoine.....St. Dominique.
Clément, N. E.....Champlain.
Chaput, Adélard.....St. Cuthbert.
Choquette, Rév. M.....St. Hyacinthe.
Clément, J. A.....St. Justin.
Chouinard, Jos.....Ste. Flavie.
Côté, Cléophe.....Les Eboulements.
Cardinal, E.....Belœil.
Charpentier, Ephrem.....L'Avenir.
Compagnie de Beurrerie de St. Benoit.St. Benoit.
Cloutier, Rév. M. X.....Three Rivers.
Cloutier, N.....Three Rivers.

Chabot, Emile.....Ste. Madeleine.
Chagnon, Samuel.....St. Paul l'Hermite.
Cardin, Pierre.....Berthier.
Chabot, George.....Ste. Hélène.
Côté, Henri.....St. Anne de Chicoutimi.
Côté, Wilfred.....St. Paul's Bay.
Camiré, Olivier.....St. Michel de Yamaska.

D

Dion, J. O.....St. Hyacinthe.
Dion, Jos.....Upton.
Dion, Frs.....Ste.Thérèse.
Dufault, Eusèbe.....Ste. Hélène.
Dépôt, J. Bte.....St. Valérien.
Dumaine, Alfred.....St. Liboire.
Dumaine, Aimé.....St. Liboire.
Durocher, Trefflé.....St. Damasse.
Duguay, J. N.....St. Zéphirin de Courval
Dubault, Geo.....St. Gabriel de Brandon.
Dufresne, G. B. R.....Banlieue of Three Rivers.
Désilets, Henri.....Three Rivers.
Duval, E. O.....Trhee Rivers.
Désilets, Petrus.....Three Rivers.
Dostaler, Chs.....Three Rivers.
Dufresne, Godefroi.....Three Rivers.
Dufresne, Edmond.....Three Rivers.
Desjardins, Antoine.....Ste Thérèse.
Duval, Alphonse.....Ste. Marguerite of Three Rivers.
Desjardins, Polydore.....St. Joseph du Lac.
Desnoyers, Michel.....St. Jean Baptiste.
Daigneault, Pierre.....St. Jean Baptiste.
Dion, Emile.....Rougemont.
Drouin, Philippe.....Somerset.
Dumas, Pierre.....St. Norbert.
Dufault, N. E.....Ste. Hélène.
Desjardins, Magloire.....St. Scholastique.
Daoust, Antoine.....St. Benoit.
Daigle, Théophile.....St. Edouard (Lotbinière).
Desrochers, Alphonse.....St. Flavien.
Deslages, Damase.....St. Césaire.
Dubeault, Jos.....St. Ambroise de Kildare.
Demers, F.....La Baie du Febvre.

E

Esinhart, John.....Montreal.

F

Fortin, S.....Chicoutimi.
Fréchette, Louis.....Ste. Madeleine.
Fontaine, Alphonse.....St. Hugues.
Fontaine, Alphée.....Weedon.
Fradette, Norbert.....St. Dominique.
Fournier, O.....Gentilly.
Ferland, Mathias.....Berthier.
Fortin, Charles J. B.....St. Dominique de Chicoutimi.
Fleurant, Magloire.....Melbourne Ridge.
Fréchette Gédéon.....Stanfold.
Fortier, Adolphe.....St. Henri de Lévis.
Fortin, Méridée.....Chicoutimi.
Fortin, Jos.....Baie St. Paul.
Frey, Maurice.....St. Hyacinthe.

G

Gaudette Dr. D.....St. Anne des Plaines
Gareau Victor.....Rivière Richelieu.
Gamache, C. S.....Cap St. Ignace,
Girard Em.....La Baie du Febvre
Gérin Rev. M. D.....St Justin.
Guertin, Alfred.....St. Casimir de Portneuf.
Gaudette Elie.....St. Antoine de Verchères.
Giard J. A.....Montreal,
Gingras, Adolphe.....St. Ephrem d'Upton.
Gouin. Chas.....Batiscan.
Gagné Théophile.....St. Edouard de Lotbinière,
Gingras, Hubert.....Ste Marie de Monnoir.
Gemme, Paul.....Ste. Marie de Monnoir.
Gaudette, Jos. Ernest.....Ste. Anne de Montcalm,
Grenier, Joseph.....Ste. Rosalie.
Girouard, Joseph.....St. Benoit.
Giard Napoléon.....Three Rivers.
Garceau Philippe.....Pointe-du-Lac.
Grenier Origène.....Three Rivers.
Gouin, Philippe.....Three Rivers.

Gouin, O.....Three Rivers.
Genest, Achille.....Gentilly.
Girard, Frs.....Ste. Anne de la Pocatière.
Garrigue, Paul.....Quebec (St. John Street.)
Genest, Xavier.....Plessisville.
Gervais, Wilfrid.....St. Stanislas.
Gauthier, Michel.....St. Germain de Grantham.
Gauthier, Jules.....St. Alexis de Chicoutimi,
Gagnon Louis.....St Urbain.
Gagnon, Alfred.....Baie St. Paul.

H

Houlde, Eusèbe.....Gentilly.
Hudon, Louis.....St Jérôme (Lake St. John.)
Hendfield, J.....Verchères,
Hamel, Geo.....Lotbinière,
Hayes, Herman.....Mount Johnson.

J

Jérôme, Philias.....Ste, Thérèse.
Jodoin, Jos.....St. Damase.

K

Kirouac, Calixte.....Warwick.

L

LaBruère, Hon. P. B. de.....St. Hyacinthe.
Lord, Aimé.....St. Edouard de Lotbinière.
Labonté, Rev, J. O.....Ste. Thérèse.
Lesage, S.....Quebec.
Lemire, Louis.....La Baie du Febvre.
Letiecq, Albert.....Bécancour.
Lafontaine, E.....St. Hugues.
Létourneau, Camille.....Ste. Madeleine.
Lecomte E.....Nicolet.
Legris, J. H.....Louiseville.
Larivière, Alfred.....St. Grégoire.
Laplante, W.H.....Ste Hélène.
Leclair, Hector L.....Ste Thérèse de Blainville,
Lemonde, Frs.....Ste. Rosalie.
Lacoursière, Philippe.....Batiscan.
Lebeau, Médéric.....Charlemagne.

Levasseur, Napoléon.....Three Rivres.
Lacourcière, Ovide.....St Laurent, Lac Manitoba.
Laurendeau, F.X.....St Barthélemi.
Lacerte, H.....Three Rivers.
Lemonde, Joseph.....Ste. Rosalie.
Lamoureux, Pierre.....Contrecœur.
Lefrançois, Samuel.....St. Léon de Maskinongé.
Legendre Wilfrid.....St. Norbert.
Lajoie et Fils.....St. Liboire.
Lafond, George.....La Baie du Febvre
Lindsay, Chs. P.....Ste Marie de Beauce.
Lambert Félix.....Ste. Croix de Lotbinière.
Laguerre, Jos.....Batiscan.
Latour, Ch. Huguet.....St. Rémi de Napierville.
Lord, Edmond.....St. Edouard de Lotbinière.
Lapointe, Pierre.....La Malbaie.
Leclerc, J. D.....Ste. Thérèse.

M

Marcoux, F. X.....Marieville,
Montminy, Rev. T.....St, Agapit de Beaurivage.
Marsan, Arthur.....St Valérien.
Marsan, J. J. A.....L'Assomption.
Maynard, Philias.....La Présentation,
Maynard Jos.....La Présentation.
McDonald, Milton.....Acton Vale.
Massicotte, Geo.....Batiscan.
Monahan, Peter.....Ste. Marthe.
McFarlane, P.....Huntingdon.
Monette, Cyrille.....St Martin de Laval.
Milot, Leonard.....St. Léon de Maskinongé.
Marion, Edmond.....St. Gabriel de Brandon.
Maynard, Camille.....St. Simon.
Marcot, Joseph.....St. Thomas de Pierreville.
Marion, Joseph.....Abbotsford.
Montplaisir, H.....Cap de la Madeleine.
Mercier, Onésime.....St. Paul l'Hermite.
Morisson, Thos.....Frelighsburg.
McCallum, A.....Danville.
Magnan, Méderic.....St. Alexis de Montcalm.
Mayer, F. X.....St. Barthelemy.
Martel, Charles.....Baie St. Paul.

N

Nicole, Alphonse.....Montmagny.

O

Ostiguy, Alf.....St. Jean Bte. de Rouville.
Ostiguy, Jos.....N. D. de B. Richelieu.

P

Prefontaine, Fulgence.....Durham-South.
Perreault, Alex.....Belœil.
Poirier, H.....Roxton Falls.
Painchaud, Jos.....Louiseville.
Pelletier, J. A.....Rivière Ouelle.
Paradis, Damase.....Valletort.
Parent, W.....St. Thomas de Pierreville.
Paradis, Firmin.....St. Alphonse de Chicoutimi.
Paré, Camille Elie.....St. Vincent de Paul.
Prince, Rev. Canon.....St. Maurice.
Plamondon, Ignace.....St. Raymond de Portneuf.
Pomerat, Charles.....St. Pie.
Pothier, H.....Three Rivers.
Poisson, Adolphe.....St. Paul de Chester.
Painchaud, Dr. C. F.....Varennes.
Poisson, Jos. L.....Gentilly.
Panneton, S.....Three Rivers.
Paris, Arthur.....St. Jean Deschaillons.
Paquin, Moïse.....Maskinongé.
Pelletier, Marius.....Berthier-en-bas.
Pelletier, Charles.....St. Basile de Portueuf.
Proulx, J.....Nicolet.
Proulx, Eusèbe.....La Baie du Febvre.
Poulin, Etienne.....St. Germain de Grantham.
Perron, Jean.....St. Alphonse de Chicoutimi.
Paquet, J. B.....Deschambault, Portneuf.

R

Riopelle, Aimé.....St. Esprit.
Riopelle, Hermas.....St. Esprit.
Racine, Charles.....St. Pie.
Rainville, Eusèbe.....N. D. de B. de Richelieu.
Roy, Charles.....Isles aux Grues

Remington, Edwin ....St. Gabriel de Brandon.
Rhô, Rév. M..... .... Three Rivers.
Robillard, Félix..... ....St. Ours.
Rainville, Charles..... .....St. Jean-Baptiste.
Rivard, Eugène..... .... St. Casimir.

S

St. Onge, Théodule..... .....Roxton-Falls.
St. Pierre, Ludger..... .....La Présentation.
Simard, B. A. Roch..... .....L'Assomption.
St. Pierre, G..... ....Three Rivers.
Salois, Edmond..... ....St. Dominique.
Smith, Edward ....Isle-du-Pads.
Simard, Frédéguine..... .....St. Alphonse de Chicoutimi
Simard, Evariste..... ....St. Alphonse de Chicoutimi.

T

Turcot, J E. Dr..... ....St. Hyacinthe.
Taché, Henri..... ....Upton.
Taché, J. de L..... .....Quebec.
Trudel, Alfred..... .....St. Prosper de Champlain.
Trudeau, Avila..... .....St. Basile le Grand.
Tremblay, Thomas ....N. D. de Laterrière.
Toupin, Louis..... ....St. Hugues.
Tessier Godefroi..... .....Ste. Brigitte.
Trappistes, Rév. Pères..... .....Oka (Deux-Montagnes).
Trudel & Trudel ....St. Prosper de Champlain.
Thibault, Louis.... ....St. Ferdinand d'Halifax.
Toupin, Louis.... ....Fecteau's Mills.
Trudel, Philippe..... .....Ste. Geneviève de Batiscan.
Trudel, Trefflé..... .....St. Narcisse de Champlain.
Tremblay, Albert..... ... .N. D. de Laterrière.
Tremblay, Charles..... .....Chicoutimi.

V

Vigneau, J. B..... ....La Baie du Febvre.
Veilleux, Philéas..... ....St. Victor de Tring.
Vadnais, Joseph..... .....St. Pie.
Vadnais, Henri..... .....St. Cuthbert.
Vaillancourt, Rév. M..... .....St George de Windsor.
Vigeant, Frs..... ....N. D. de Stanbridge.

W

Ward, Jos..... .....Montreal.
Wilson, W..... ....Montreal.
Wilson, Frank..... ....Montreal.

Memorandum

To the members of the Committee on Agriculture of the Legislative Assembly of the Province of Quebec,

Gentlemen,

At the general annual meeting of the Dairymen's Association of the Province of Quebec, held at Three Rivers on the 19th. and 20th. of January last, the following resolution was unanimously passed :

" That the Dairymen's Association, in convention at Three Rivers, " name a committee composed of all the officers and directors of the " Association, to communicate with the Committee on Agriculture of the " Provincial Legislature, for the purpose of obtaining, through its inter- " vention that the government, for the future, take upon itself the duty of " paying the entire salaries of the inspectors of the Association, and of " defraying the expense of printing its annual reports ; and to confer " with the said committee on all the suggestions that have been, or shall " be made at the present meeting.

The undersigned, in virtue of the powers conferred upon them by the absent members of the committee so named, of which they themselves form part, have the honour respectfully to lay before you, on behalf of the said Association, the following observations :

The Dairymen's Association, founded in 1882 under the authority of the act. 45 Vict., Chap. 66, having for its special object the encouragement and improvement of the manufacture of butter and cheese, and of all things connected with that industry, was responsive, in the spirit of its founders and promoters, to an important want, born and developed in the enormous expension of the dairy-business of this province and this country.

To attain the object of its foundation, the Association took the following means, as being the most suitable, to produce prompt, and at the same time, important and lasting results:

Annual meetings and public addresses :—The Association has held the following general meetings :

November 28th. 1882.....St. Hyacinthe ;
November 14th. and 15th. 1883.....St. Hyacinthe ;
November 12th. and 13th. 1884.....St. Hyacinthe ;
March 11th, 1885.....Quebec ;
January 13th. and 14th. 1887.....St. Hyacinthe ;
April 14th. 1886.....Quebec ;
January 15th. and 20th. 1887.....Three Rivers ;

For these meetings, the association secured the obliging services of our best agricultural lecturers; by the list of the subjects discussed, and by the fact that these meetings were attended, almost exclusively, by those who devote themselves chiefly to the dairy-business, or to furnish it with the raw material, the importance of this mode of action may be determined. The following is a list of the different subjects treated by the lecturers at the meetings:

The state of the dairy-business.
The obstacles to the progress of the dairy-business.
The past, present and future of the dairy-business.
The commerce of the world in the products of the dairy.
Agricultural clubs.
Benefits of agricultural lecturers.
The duty of the clergy as regards agriculture.
Agriculture and the dairy-trade.
Courses or shifts of cropping land.
Cultivation of maize as green-fodder.
Agriculture.
Drainage of a dairy-farm.
Meadows and pastures.
Plan of cultivation for the North-East of the province of Quebec.
Preservation of manures.
Food and care of stock.
The milk-breeds.
Improvement of stock.
Improvements in cultivation and of stocks.
Yields of milch-cows.
The feeding of milch-cows in Europe and Canada, compared.
Management of milch-cows
Preparation of milch-cows for exhibition.
Effects of food in the improvement of stock.
Establishment of a herd-book of Canadian cattle.
Siloes and Pastures.
Experiments on ensilage.
Cheap ensilage.
Result from siloes in 1886, and advice to builders of siloes.
Testing of milk at the factory.
Analysis of butter-fat in milk.
Purchase of milk according to its richness in cream, by the centrifugal method.

Centrifugal skimming of milk.
A centrifugal creamery.
Manufacture of butter, with centrifugal skimmers.
Report of creamery-inspectors.
Home butter making.
Establishment of a factory, and cheese-making.
On what depends the success of a cheese-factory.
Cheese making in winter.
Faults committed in cheese-making.
The combined system considered.
Reports of the inspectors of cheese-factories and of the school-factory.
Cheese-making after the Cheddar-process, as it is to-day.
Memorandum on boxes for cheese.
Book-keeping for factories.

The different subjects were treated by the gentlemen whose names follow :

Mr. S. M. Barré,
" E. A. Barnard,
" Siméon Lesage,
" W. H. Lynch,
" J. C. Chapais,
" Revd M. Montminy,
" " Mr. Garon,
" N. Bourque,
" Hon. Ls. Beaubien,
" J. J. A. Marsan,
" Alexis Chicoine,
" S. A Brodeur,
" Antoine Casavant,
" Dr C. J. Coulombe,
" J. M. Archambault,
Mr. J. B. Harris,
" J. A. Couture,
" J. L. Lemire,
" J. M. Jocelyn,
" Saül Coté,
" D. M. McPherson,
" J. H. Legris,
" J. A. Ruddick,
" J. B. D. Schmouth,
" James Cheesman,
" Aimé Lord.
" Revd Mr. Gérin,
" " Mr. Chartier,
" Maurice Frey,
" Joseph Painchaud,
" J. de L. Taché.

For the better appreciation of these lectures, the undersigned bring to the notice of the members of the committee that, among other things, they have solved three of the most important questions of our times :

1. The creation of agricultural clubs and lectures. The support given by the association to these powerful means of diffusing agricultural information secured the assistance of the government to the work of carrying on these lectures. and, by increasing the number of the clubs, it has

brought about the establishment of a regular organization, which has already held two general meetings, the last of which, at Three Rivers, deserves the fullest attention of our governing powers.

2. The establishment of a herd-book for Canadian cattle. This question by no means a modern one has thus received its solution. The competitions organized by the association for the last three years, have brought into prominence the merits of the Canadian cow, and in that respect, the support given by our association to the efforts of individuals, has decided the regular and official creation of a herd-book for Canadian cattle, on which the association relies greatly for the rousing of the public attention, and for the means of making people understand, by results easy of comprehension by everybody, the importance of judicious and well-thought out methods of breeding and raising stock.

3. The question of ensilage. The practice of ensilage, which has revolutionized agriculture in many places, and has been laid before the public, and has passed into the domain of settled facts through the labours of the association. Of twenty siloes and upwards built in the province of Quebec in 1886, at least $\frac{3}{4}$ belong to members of our association, and are entirely due to the descriptions furnished in our lectures and the discussions these lectures gave rise to. And, in this, our sister provinces have been outstripped.

TEACHING.—The association has arranged a staff of itinerant teachers, who have given instruction in the making of butter and cheese in the factories. This part of the operations of the association is the one that has given the best immediate results. Messrs. J. M. Archambault and Joseph Painchaud were the inspectors employed by the association. At first, a few visits were also made by Messrs. Barré and Jocelyn. Mr. Painchaud has been placed under the orders of the association since September 1st., 1885 ; Mr. Archambault being the only one paid by the association since its establishment in 1882. The visits made by the inspectors are distributed as follows.

FACTORIES.	1883.		1884.		1885.			1886.			Grand Total.		
	B.	C.	B.	C.	B.	C.	B.C.	B.	C.	B.C.	B.	C.	B.C.
S. M. Barré	4	....	....	....	....	....	....	....	....	....	4	....	....
J. M. Jocelyn	....	1	....	....	....	....	....	....	....	....	....	1	....
Jos. Painchaud	....	....	....	....	13	29	3	25	33	3	38	62	6
J. M. Archambault	....	22	....	26	....	118	....	9	95	....	9	264	....
Total	4	26	....	26	13	147	3	34	128	3	51	327	6
											Grand Total.		384

To the figures 384, about fifteen second visits made to the factories last year should be added.

School-factory.—Besides the instruction given at the factories, the Association has again offered gratuitous lessons to its members at the school-factory of Notre-Dame de St. Hyacinthe. This factory, the property of Mr. Archambault, was subsidised for the purpose of receiving as pupils, exclusively, dairy men who were already instructed to a certain extent in their work, whether by having pursued an ordinary apprenticeship, or by having practised the art during one or more years. This greatly enhanced the value of the results of the lessons given. The factory received:

In 1884, 20 pupils who passed, altogether——days at the factory.
" 1885, 52 " " " " 108 " " "
" 1886, 38 " " " " 83 " " "

Publicity :—All the labours of the association have been recorded in its printed official reports. The association has already published four annual reports with two supplements. forming altogether two volumes, one of 305 pages, small in 8vo, and the other of 278 pages, large in 8vo. These reports contain all the legislation concerning the dairy-trade, the names of the members, the official minutes of the general meetings, the reports of the inspector-professors, of the school factory, of the competitions, and of other matters of interest. The members of the association receiving these reports free, have been in a position to become apostles of the suggested improvements, of the approved new practices, and of the good advice therein contained. The report for last year, not yet in print, will form a volume of nearly 200 pages, in the same type as the reports of the departments which should be added to the previous ones. The editions of these reports have averaged about 700 copies each, and rather more than the half of each edition has been distributed each year.

Information.—Lastly, the office of the association has been the medium through which the members have obtained a mass of information both necessary and useful; it has kept in communication with them by means of circulars distributed in great numbers at different seasons of the year. The circulars in question, comprising about 63 different forms (*formes*), represent, when put together, an edition of 29,000 copies, issued since the founding of the association.

The interested part of the public seems to have appreciated the labours

of the association, as may be seen by the continuous increase of the list of members which has been augmented as follows :

1st	year	1882,	66	members.
2nd	"	1883,	70	"
3rd	"	1884,	117	"
4th	"	1885,	210	"
5th	"	1886,	253	"

The normal development of all these modes of action has necessitated a considerable increase of expenditure which has not been balanced by an equivalent increase of revenue.

Very little can be saved as regards the different heads of expenditure, as the committee may convince itself by making inquiries and asking for explanations of the statement of the finances of the association which follows :

(For the sums, see the report of the directors, given above p. 481.)

The only way to make the finances of the association balance, if it is not to receive that aid from the government which it believes itself entitled to expect, is to restrict its sphere of action, a means which will certainly tend to injure the true interest of the dairy-trade, and which the weighty testimony received as to the efficient working of the association will certainly not justify.

The legislature, by voting every year the grant to the association, has recognized by its action the good right of the association to this appropriation of public money, and the committee will admit that the grant ought to follow in amount the progress and advance of the association. This trifling grant is hardly proportioned to the importance of a trade which every year gives millions to the province.

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